Five-Year Review Report

Third Five-Year Review Report
for
Raymark Industries, Inc. Site
Stratford, Connecticut

September 2010

Prepared by:

The United States Environmental Protection Agency
Region 1, New England
Boston, Massachusetts

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EPA New England

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ES EXECUTIVE SUMMARY

This is the third five-year review for the Raymark Industries, Inc. Site ("Raymark site" or "Site") in the Town of Stratford, Connecticut (the Town). This statutory five-year review is required since hazardous contamination remains above levels that allow for unlimited use and unrestricted exposure. The review was completed in accordance with EPA's "*Comprehensive Five-Year Review Guidance*" (EPA540-R-01-007) (EPA 2001).

The Raymark Facility (Facility), formerly named Raybestos – Manhattan Company, operated from 1919 until 1989, when the plant was shut down and permanently closed; however, the property clean-up actions were not completed until 1997. Following completion of a Remedial Investigation/Feasibility Study (RI/FS), EPA designated the Facility as Operable Unit 1 (OU1). Other OUs that are affiliated with the Raymark Site are OU2, OU3, OU4, OU5, OU6, OU7, OU8, and OU9. These OUs are not evaluated in this five-year review because none have a Record of Decision (ROD) designating final cleanup. See Appendix C for a discussion on these other OUs.

The OU1 property is a 33.4-acre parcel that has been transformed from a single use industrial property that manufactured friction materials containing asbestos and non-asbestos components, metals, phenol-formaldehyde resins, and various adhesives to a shopping center with multiple businesses. The primary anchors were initially Walmart, Shaws Supermarket, and Home Depot, however ShopRite now occupies the former Shaws Supermarket building and Webster Bank was also built on the property.

In the past, there were low-lying gravel and grass areas on the property, in addition to four lagoons that received manufacturing waste. In 1997, as part of the OU1 clean-up, these areas were deposited with contaminated fill consisting of 'Raymark wastes' excavated from residential and municipal properties in Stratford and covered with a low permeable cap system (cap). The property elevation also rose substantially with the deposition of clean fill and the placement of a cap, designed as a modified low-permeability Resource Conservation and Recovery Act (RCRA) cap, over the property. On top of this cap, buildings and an asphalt parking lot have been constructed. In addition to the operating businesses, there are two treatment buildings on-site located in the eastern and western ends of the property. There are two entrances/exits on the property that lead onto busy roads and have traffic signals to control the traffic flow.

The ROD for Raymark OU1 was signed by EPA on July 3, 1995. The date of initiation of the Raymark OU1 source control remedial action is September 1995. A review is required every 5 years as hazardous contamination remains on OU1 above levels that allow for unlimited use and unrestricted exposure. The first five-year review was completed in September 2000 and the second review was completed in September 2005, the triggering date for this five-year review. This document presents the third five-year review.

In the ROD, EPA selected a source control (for soils only) remedy for OU1 at the Raymark Site. As stated in the ROD, the selected remedy was designed to provide containment of contaminated soils, control leaching of contaminants to the groundwater, and protect against surface erosion. The remedy included decontamination, demolition, non-aqueous phase liquid (NAPL) removal, capping, and institutional controls. In 1996 and 1997, as part of the property clean-up activities, the OU1 buildings were demolished and a permanent RCRA modified cap was placed over the entire OU1 property. The groundwater under the Raymark Facility was not included in the OU1 source control remedy, but has been included in the overall groundwater RI (OU2) for the entire Raymark Site (see Appendix C for OU2 information).

In 1997, EPA completed the source control remedy construction activities and held a formal dedication on the OU1 property. In 1998, the Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1. The formal EPA/state superfund contract (SSC) was signed between EPA and the State of Connecticut in 1995 for approval of the remedial action and a financial commitment of the required 10 percent cost share. No administrative or technical modifications/changes have ever been formally documented. Appendix D of the SSC refers to the future O&M tasks for the state and directs the state to comply with the to-be-developed O&M plan (subsequently developed in May 1998). The details on the O&M requirements for OU1 were broadly described in the 1995 ROD and the May 1998 OU1 O&M Manual. The general guidelines for the state were: ensure long-term integrity of the remedy, complete all routine monitoring, and perform system maintenance. No dollar levels or monitoring frequencies were identified to meet these goals.

The modified RCRA cap constructed over the source control remedy is functioning as designed and remains in good condition, thus preventing contact with the contaminated soils that remain on OU1.

Institutional controls and a regular inspection program by the CTDEP, its consultant, and the property owner and its consultant, are in place at OU1. A fence and extensive landscaping have directed access primarily through two busy traffic entrances/exits from OU1. A monitoring program is in place to maintain the requirements of the environmental land use restrictions (ELURs) that are recorded on the OU1 land records. CTDEP oversees this monitoring program.

Monitoring of NAPL, on-site air emissions from extracted soil gas, and groundwater are performed routinely by the CTDEP and its consultant. To date, minimal NAPL has been recovered, air emissions from extracted soil gas are below state air requirements, and overall, groundwater contamination has not significantly changed. Monitoring of negative pressures in the soil gas collection (SGC) system indicate that the system is effectively preventing potential vapor intrusion into buildings constructed over the cap. The NAPL collection system should be re-evaluated to maximize or optimize NAPL recovery. The issue and recommendations identified in this five-year review are contained in the following Summary Form and are described in Section 9.0.

Five-Year Review Protectiveness Statement:

The remedy at OU1 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled.

Five-Year Review Summary Form

FIVE-YEAR REVIEW SUMMARY FORM		
SITE IDENTIFICATION		
Site name *(from WasteLAN):* Raymark Industries, Inc. Superfund Site		
EPA ID (*from WasteLAN):* CTD001186618		
Region: 1	**State:** CT	**City/County:** Stratford/Fairfield
SITE STATUS		
NPL Status: ☒ **Final** ☐ **Deleted** ☐ **Other (Specify)**		
Remediation Status (choose all that apply): ☐ **Under Construction** ☐ **Operating** ☒ **Complete**		
Multiple OUs?* ☒ **YES** ☐ **NO**	**Construction completion date:** 11/1997	
Has site been put into reuse? ☒ **YES** ☐ **NO**		
REVIEW STATUS		
Lead agency: ☒ **EPA** ☐ **State** ☐ **Tribe** ☐ **Other Federal Agency:**		
Author name: Ronald Jennings		
Author title: Task Order Project Officer	**Author Affiliation:** U.S. Environmental Protection Agency Region 1	
Review period: 4/1/2010 to 9/30/2010		
Date(s) of site inspection:** 5/10/2010		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ NPL State/Tribe-lead ☐ Non-NPL Remedial Action Site ☐ Regional Discretion		
Review number ☐ 1 (first) ☐ 2 (second) ☒ 3 (third) ☐ Other (specify)		
Triggering action ☐ Actual RA Onsite Construction at OU # ☐ Actual RA Start at OU# ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)		
Triggering action date (from WasteLAN): September, 2005		
Due date (five years after triggering action date): September 30, 2010		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Five-Year Review Issues:

1. The NAPL extraction system is removing NAPL, however, only one recovery well (RW-3) is functioning and that well is extracting minimal quantities.

Recommendations and Follow-up Actions:

1. Optimize the NAPL recovery system by redeveloping recovery well 3 (RW-3), and perform re-evaluation of entire NAPL recovery system during the OU2-Groundwater Feasibility Study to determine whether the system should be modified to increase its effectiveness.

Protectiveness Statement:

The remedy at OU1 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled.

1.0 INTRODUCTION

This report documents the third five-year review for the Raymark Industries Inc. Site ("Raymark site" or "Site") in the Town of Stratford, Connecticut (the Town). The purpose of this five-year review is to determine if the remedy selected for OU1 is protective of human health and the environment. The methods, findings, and conclusions of the review are documented in this Five-Year Review Report. In addition, five-year review reports identify issues found during the review, if any, and identify recommendations to address them.

This report summarizes the five-year review process, investigations, and remedial actions undertaken at Raymark Operable Unit (OU) 1 or OU1, evaluates the monitoring data collected within the last 5 years, reviews the Applicable or Relevant and Appropriate Requirements (ARARs) specified in the Record of Decision (ROD) for changes, and describes the current status of OU1. In addition, the report provides a brief summary of the status of the eight other Raymark Site OUs in Appendix C. To date, none of the other OUs have resulted in a ROD.

The United States Environmental Protection Agency, Region 1 (EPA) prepared this five-year review pursuant to the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) §121 and the National Contingency Plan. CERCLA §121 states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

The EPA interpreted this requirement further in the National Contingency Plan; 40 CFR §300.430(f)(4)(ii) states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

The ROD for Raymark OU1 was signed by EPA on July 3, 1995 (EPA 1995). The date of initiation of the Raymark OU1 source control remedial action is September 1995. This statutory Five-Year Review is required since hazardous contamination remains on Raymark OU1 above levels that allow for unlimited use and unrestricted exposure. The first five-year review was completed in September 2000 (EPA 2000). The second five-year review was completed in September 2005 (EPA 2005). This is the third five-year review for OU1. EPA has conducted this five-year review of the remedial action implemented at OU1. This review was conducted from April 2010 through September 2010. This report documents the results of that review. This report was developed by Ronald Jennings, EPA Project Manager, with support from Nobis Engineering, Inc. under EPA Contract No. EP-S1-06-03, Task Order Number 0054-FR-FE-01H3. Assistance in the development of this report was provided by the Connecticut Department of Environmental Protection (CTDEP). The activities conducted for the five-year review were based on the Statement of Work prepared by EPA and dated February 5, 2010 and on the approved Nobis Engineering Draft Work Plan, dated March 17, 2010. This review was completed in accordance with EPA's "*Comprehensive Five-Year Review Guidance*" (EPA540-R-01-007) (EPA 2001).

The OU1 Source Control ROD was signed in July 1995. The selected remedy included decontamination, demolition, non-aqueous phase liquid (NAPL) removal, capping, and institutional controls. Construction of this source control remedy began in 1995 and was completed in 1997. On January 19, 2000, the property was sold in a bankruptcy action to a consortium of companies (Walmart Real Estate Business Trust, STFD, LLC, and Home Depot U.S.A.) who developed the property for retail purposes. Charter, LLC assumed ownership of the properties from STFD, LLC on April 3, 2002. An environmental land use restriction (ELUR) was filed with the Town of Stratford land records. The OU1 property currently has four businesses, Home Depot, Walmart, ShopRite, and Webster Bank, operating on the property. ShopRite currently occupies the former Shaws Supermarket building. Renovations to the former Shaws building, including utility work in preparation for the arrival of ShopRite, were overseen by CTDEP and performed in compliance with the ELUR. A Subway is also in operation in the Walmart building. Walmart Real Estate Business Trust owns the Walmart building and an additional 13.12 acres of land on the OU1 property. Home Depot U.S.A. owns Home Depot, the Webster Bank property, and an additional 12.41 acres of land on the OU1 property. The former Shaws building was owned by STFD, LLC until ownership was transferred to Charter, LLC in 2002, who rents out the building footprint to ShopRite. Charter, LLC now also

owns 6.52 acres of land on the OU1 property. Since an ELUR was recorded, all businesses on-site must comply with ELURs. Operation and maintenance (O&M) of the source control remedy was turned over to the CTDEP in August 1998. Groundwater beneath and down-gradient of OU1 is currently part of OU2 (TtNUS 2005); a final decision on the clean-up remedy for the groundwater will be developed in the future.

2.0 SITE CHRONOLOGY

This section presents the Site historical events in chronological order to allow the reader to see the decisions made that lead to the selection of the clean-up remedy for OU1.

EVENT	DATE
Raymark Industries, Inc., manufactured automotive and heavy vehicle friction parts. Production processes generated waste by-products.	1919-1989
Waste by-products were disposed of in lagoons on the Raymark property. As lagoons became full, waste was excavated and used as fill on the Raymark property and throughout Stratford.	1919-1984
The Town and CTDEP installed a cover for a number of municipal properties, temporarily protecting area residents from direct exposure to contaminated wastes.	1978 and 1993 – 1995
With EPA oversight, Raymark covered four lagoons, removed bags and containers filled with hazardous material, secured the property with fencing, boarded up buildings, and re-routed the on-site drainage system to minimize movement of contamination off the Raymark Facility.	Fall, 1992 – 1995
Dioxins were discovered on the Raymark Facility. Sampling of residential, municipal, and commercial properties revealed the widespread presence of lead, PCBs, and asbestos, in addition to the dioxins, in areas where Raymark fill was used in Stratford. The levels of these contaminants were reviewed by the Agency for Toxic Substances and Disease Registry and were considered a health risk. EPA began collecting and testing soil samples from properties located throughout Stratford where Raymark fill was suspected to have been used. As of 1995, about 40 residential areas showed contamination high enough to need clean-up.	Spring, 1993
EPA conducted residential clean-ups by excavating contaminated soils. The excavated material was trucked to and placed at the Raymark Facility.	1993 – 1995
EPA proposed to add the Raymark Facility and properties that contained Raymark waste to the National Priorities List (NPL). Listing on the NPL authorizes the expenditure of CERCLA remedial action funds.	January 18, 1994
The NPL listing was final.	April 25, 1995.
OU1 Record of Decision signed.	July 3, 1995
EPA/State Superfund Contract signed.	July 1995
Stockpiling of contaminated soils from residential removals and Wooster School removal completed.	July 1995

EVENT	DATE
Start of OU1 Remedial Action construction.	September 1995
Demolition of on-site buildings began.	September 1995
Building demolition completed.	April 1996
RCRA low-permeability cap system installation began.	October 1996
Treatment systems construction began.	November 1996
Cap system construction completed.	August 1997
Final site grading work completed.	October 1997
Site dedication.	November 1997
Site systems began operations.	December 1997
Operations & Maintenance Plan completed.	May 1998
Operation and maintenance of Site turned over to CTDEP.	August 1998
CTDEP conducted oversight activities.	1998 to present
Site property sold to Walmart Real Estate Business Trust, STFD, LLC, and Home Depot U.S.A.	January 19, 2000
Filing of ELURs on land records.	February 17, 2000
First Five-Year Review Report.	September 2000
Charter, LLC assumes ownership of STFD, LLC properties.	April 3, 2002
Construction of Walmart, Shaws, Home Depot (completed).	2002
Construction of Webster Bank (completed).	June 2005
Second Five-Year Review Report.	September 2005
Third Five-Year Review Report.	September 2010

3.0 BACKGROUND

The following sections describe the Raymark OU1 physical characteristics, land and resource use, site history, and the basis for taking the clean-up action. The OU1 property is located at the intersection of East Main Street and Barnum Avenue Cutoff in Stratford, Connecticut (see Figure 3-1).

3.1 Physical Characteristics

OU1 is a 33.4-acre parcel that has been transformed from a single use industrial property that manufactured automotive friction materials, to a shopping center with multiple businesses. The primary anchors, Walmart, Shaws Supermarket, and Home Depot, were completed in 2002. Webster Bank was constructed in 2005 after the second five-year review was conducted. Shaws Supermarket closed in 2010 and the building was recently renovated and re-opened as ShopRite.

The parcel has always had a large parking area and building footprint. In the past, most of the property (approximately 60 to 70 percent) was covered by buildings and parking lots. The parking lots were a mix of gravel and asphalt that had deteriorated over the years. In the parking areas were four lagoons that received manufacturing waste from the buildings/manufacturing process (Figure 3-2). Between 1993 and 1995, excavated contaminated soils from the residential clean-ups were placed at the Site. In 1997, as part of the OU1 clean-up, the lagoon areas were filled in and the property elevation rose substantially with the deposition of clean fill and the placement of a modified RCRA cap over the property. On top of this cap, shopping center buildings and an asphalt parking lot have been built. In addition to the shopping center buildings, there are two treatment buildings on-site located in the eastern and western ends of the property. There are two entrances/exits on the property that lead onto busy roads and have traffic signals to control the traffic flow (Figure 3-1). In March 2009, a bus shelter was installed on the western portion of the OU1 property.

3.2 Land and Resource Use

The entire property is presently used as a large, active shopping center. It is surrounded by roads on the northern, eastern, and southern ends of the property. There is an operating railroad track along the perimeter of the western side of the property. The property is almost completely covered by an asphalt parking lot and buildings. There are trees around the perimeter of the property and small plantings throughout the parking lot area. The shopping center has an active loading/unloading area for vehicles in the rear of the building along the railroad tracks. There are garden centers located at both ends of the shopping center building, at Home Depot and Walmart. Although overnight parking is not prohibited by an ELUR and does not impact maintenance, there is no overnight parking, as posted in the parking lot by the stores. Also, there currently is no bus traffic that exceeds the weight limits of 3,000 lbs. per square foot allowed on the property.

An ELUR, as described in Section 4.2.6, was placed on the property to protect the integrity of the cap through the property land records. In the past, CTDEP has issued enforcement actions against Walmart for violating the ELUR, although no damage to the cap has occurred. Over the past 5 years, there have been no ELUR violations and CTDEP has issued no enforcement actions. Renovations to the former Shaws Supermarket building, including utility work in

preparation for the arrival of ShopRite, were overseen by CTDEP and performed in compliance with the ELUR.

3.3 History of Contamination

The Facility, formerly named Raybestos – Manhattan Company, operated on the OU1 property from 1919 until 1989, when the plant was shut down and permanently closed. Raymark manufactured friction materials containing asbestos and non-asbestos components, metals, phenol-formaldehyde resins, and various adhesives. Primary products were gasket material, sheet packing, and friction materials including clutch facings, transmission plates, and brake linings. As a result of these manufacturing activities, soil at OU1 became contaminated with metals, asbestos, dioxins, and polychlorinated biphenyls (PCBs). Groundwater at OU1 became contaminated with volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals.

During the Facility's 70 years of operation, it was common practice to dispose of its manufacturing waste as "fill" material both at the Raymark Facility, and at various locations in Stratford. The manufacturing wastes from different plant operations were used to fill low-lying areas on-site to create additional space for Facility expansion. Based on aerial photographs and reported knowledge of Site activities, most of the on-site disposal occurred between 1919 and 1984, and progressed essentially from north to south, across the OU1 property. As a result of the disposal of these manufacturing wastes on the property, soils at the Facility became contaminated primarily with asbestos, dioxins, lead, copper, and PCBs. New buildings and parking areas were constructed over these filled areas as the manufacturing facility expanded. During this same time frame, Raymark also offered manufacturing wastes as "free fill" to employees, residents, commercial properties, and the Town.

During peak operations at the Facility, approximately two million gallons of water were used for plant processes each day. Municipal water was used for both contact and non-contact cooling water. During the 1970s, to supplement this source, Raymark installed an additional on-site supply well. The well, located in the northeastern corner of the Facility, was used for non-contact cooling water. Facility water was re-circulated, with some percentage re-injected into the on-site well; the remaining water and municipal water were discharged through the Facility's drainage system.

While operational, the Facility was underlain by an extensive manmade drainage system network used to collect water and wastes from the manufacturing operations and divert them into the Facility storm drainage system, which also collected storm water runoff.

Wastewater was discharged to a series of four settling lagoons located in the southwestern corner of the Facility, and along the southern property boundary near Longbrook Avenue and the Barnum Avenue Cutoff. The wastewater consisted of wastewater from the acid treatment plant, wet dust collection, paper making processes, non-contact cooling water, and wastewater from the solvent recovery plant operations.

Solids were allowed to settle in Lagoon Nos. 1, 2, and 3 prior to the discharge of clarified wastewater and unsettled solids to Lagoon No. 4. Lagoon No. 4 discharged into Ferry Creek. Discharge of wastewater to Lagoon Nos. 1, 2, and 3 ceased in 1984. These lagoons were closed in December 1992 and January 1993. During the fall of 1994, storm water drainage that exited the Raymark Facility through Lagoon No. 4 was diverted around this lagoon and connected directly to the storm sewer. The storm sewer ultimately discharged to Ferry Creek. Lagoon No. 4 was closed in early 1995, prior to the placement of the permanent cap over the property.

During the operation of the lagoons, the settled material in the lagoons was periodically removed by dredging. During the Facility's 70 years of operation, it was common practice to dispose of both this dredged lagoon waste and other manufacturing waste as fill material both at the Raymark Facility and at various locations throughout Stratford.

Numerous non-Facility (non-OU1) locations where Raymark waste was disposed of as "free fill" were determined to be contaminated with asbestos, lead, copper, and/or PCBs at levels that posed a potential threat to public health. To abate the potential health threat of waste at residential properties, residential locations were cleaned up under CERCLA time-critical removal actions from 1993 through 1995. The excavated material from these residential locations was placed under the permanent cap at the Raymark Facility during the OU1 Remedial Action. Raymark waste identified at one municipal property, Wooster Middle School, was also excavated, stored, and placed under the permanent cap at OU1.

3.4 Other Operable Units

Numerous non-facility disposal locations have been investigated to determine the extent of contamination caused by the disposal of Raymark manufacturing waste. Many of these areas have been identified as having health risks. For the purposes of investigation, the Raymark Site, including the disposal locations, has been divided into nine OUs. As shown on Figure 3-3, these units are:

- Raymark Facility (OU1);
- Groundwater contamination beneath the Raymark Facility and entire Site (OU2);
- Upper Ferry Creek Area (OU3, Area I);
- Raybestos Memorial Ballfield (OU4);
- Shore Road (OU5);
- Additional Properties (OU6);
- Lower Ferry Creek Area (OU3, Area II or OU 7);
- Beacon Point Boat Launch Area (OU3, Area III or OU8); and
- Short Beach Park and Stratford Landfill (OU9).

The eight other OUs (OU2 to OU9) are in various stages of investigation. To date, none of these other OUs has resulted in a ROD. As a result, this five-year review is focused on only OU1. A summary and status update of the eight other OUs is provided in Appendix C. See Figure 3-3 for the location of each OU.

3.5 Basis for Taking Action

EPA selected a source control remedy for OU1 to address contaminated soils beneath the 33.4-acre Facility. The entire 33.4 acres was contaminated with wastes from the manufacturing processes that took place at OU1 over the 70 years of operation. The selected remedy only addressed the contaminated soils. The groundwater under the former Raymark Facility was included in OU2. The overall Site chronology is presented in Section 2.0 and presents the history of the decisions made that led to the selection of the clean-up remedy for OU1. The field investigation work was undertaken at OU1 primarily during the early 1990s, from 1991 to 1995; however, because it was an operating RCRA facility, samples of the groundwater, lagoons, and

other waste streams were sampled in the 1980s as well. The following provides an overview of the sampling that occurred at OU1 (HNUS 1995):

- Geologic Investigations – 1981 to 1993;
- Groundwater samples – 1981 to 1994 (subsequent sampling rounds have occurred up to 2005, but they were performed after the ROD was signed);
- Sediment samples – 1992;
- Soil samples – 1992 (chemical analysis);
- Building samples – 1992;
- Surface Water samples – 1993; and
- Tidal Study – 1994.

Based on these investigations and soil sampling results, a human health risk assessment (HHRA) for OU1 evaluated risks to workers and trespassers from incidental ingestion and direct contact with soil and risks to on-site workers and nearby residents from inhalation of airborne dust and VOCs. The HHRA quantitative evaluation of soil exposures identified unacceptable cancer risks for industrial workers and trespassers ranging from 1.4×10^{-4} to 1.3×10^{-2}. PCBs, dioxins/furans, carcinogenic polycyclic aromatic hydrocarbons (PAHs), and trichloroethylene (TCE) were the principal contributors to cancer risk. Non-cancer hazard indices and hazard quotients for copper exceeded the target of 1 for industrial workers in the sewer easement area of OU1. The HHRA evaluated asbestos in soils qualitatively and concluded that asbestos contaminated soils at OU1 present a potential human health risk to on-property and off-property receptors. The HHRA evaluated lead in soils qualitatively and concluded that lead contaminated soils at OU1 present a potential human health risk. The HHRA also evaluated potential exposures to vapors and dust migrating off-property via the wind by individuals residing or working downwind of OU1 qualitatively and concluded that the potential exposure was limited by current conditions, but if site conditions were altered, there was a potential risk. The HHRA semi-quantitative evaluation of potential exposures to vapors (VOCs) within on-site existing or future buildings suggested a potential problem via this pathway.

The selected source control remedy addressed the unacceptable risks to human health posed by contaminants at OU1 by preventing direct contact exposures to soil and preventing inhalation exposures to airborne asbestos and VOCs. See Section 4.1 for a discussion of the selected remedy.

This five-year review is the third five-year review for OU1 at the Raymark Site, based on the remedial action start date of September 1995.

4.0 REMEDIAL ACTIONS

This section describes the remedial actions selected for and implemented at OU1 as described in the ROD dated July 3, 1995 (EPA 1995). An update on the remedy maintenance was provided by Ronald Curran of the CTDEP.

4.1 Remedy Selection

Remedial action objectives were developed for OU1 as part of the Final Source Control Feasibility Study (FS) for OU1. The objectives were developed to mitigate existing and future potential threats to human health and the environment identified in the HHRA. As summarized in the ROD, the remedial action objectives (RAOs) for OU1 were the following:

- To prevent human exposure (incidental ingestion and dermal contact) to the contaminated soil-waste materials;
- To minimize leaching of contaminants to groundwater from on-site source areas; and
- To prevent human exposure to contaminants in the buildings, process equipment, and subsurface drains.

Five source control alternatives were evaluated for OU1-Raymark Facility. Details of each are presented in the ROD. The selected remedy was designed to provide containment of contaminated soils, control leaching of contaminants to the groundwater, and protect against surface erosion. The remedy included decontamination, demolition, NAPL removal, capping, and institutional controls. The remedy included the following components, which are discussed in the sections denoted in parenthesis:

- Decontamination and demolition of all Raymark Facility buildings and structures (4.2.1);

- Backfilling low-lying areas within the Raymark Facility with demolition materials and/or with those materials placed on the Raymark Facility from the residential and Wooster Middle School excavations (4.2.1);

- Compaction and grading of the Site to provide the appropriate slope for the base of the cap (4.2.1);

- Capping of the Site with a RCRA Subtitle C multi-layered impermeable cap, including soil gas collection (4.2.2, 4.2.4, 4.2.5);

- Removal of highly concentrated pockets of liquid (solvent) contamination (NAPL) from contact with groundwater from known areas (4.2.3);

- Ensuring the long-term integrity of the cap through an adequate O&M program and institutional controls (deed restrictions) (4.2.6);

- Conducting routine monitoring of groundwater and surface water, and air monitoring at the Site (4.2.7); and

- Five-year reviews (4.2.8).

In addition, the ROD contained provisions for undertaking additional studies to further evaluate the extent of groundwater contamination beneath and migrating from the Raymark Facility. These studies were to determine whether this groundwater contamination is impacting, or may in the future impact, human and/or environmental receptors. The selected groundwater clean-up remedy will be addressed in a separate ROD as part of the groundwater cleanup (OU2). The status of this effort is described in Appendix C.

Details on completion of the OU1 remedy components are provided below in Sections 4.2.1 through 4.2.8. Additional details can be found in the *Remedial Action Report for the Raymark Industries, Inc. Superfund Site, Raymark Industries Manufacturing Plant, Operable Unit 1* (Foster Wheeler 1999) or the *Basis of Design/Design Analysis Report* (Foster Wheeler 1996).

4.2 Remedy Implementation

This section describes the responsibilities for and implementation of the components of the remedy specified in the ROD.

According to the Remedial Action Report (Foster Wheeler 1999), the design of the remedial action began in May 1995 with the development of planning documents and design specifications for the demolition of the Raymark buildings. Design of the cap, the NAPL and gas collection treatment facilities, and the groundwater monitoring wells began at approximately the same time. The EPA contracted with the U.S. Army Corps of Engineers (USACE) to complete the clean-up and stabilization of OU1, and the USACE chose Foster Wheeler Environmental Corporation (now Tetra Tech EC, Inc.) as the contractor to carry out the work, including the demolition and cap construction activities and the operation of the cap and associated treatment and monitoring systems for a specified period after the cap was completed (Foster Wheeler 1998).

Demolition of the on-site buildings began in September 1995 and was completed in April 1996. The ground improvement programs began in February 1996. The installation of the cap liner system began in October 1996, and the treatment systems construction began in November 1996. The cap liner system construction was completed in August 1997, and the final site grading work was completed in October 1997. All site work was complete in November 1997 for OU1. The site systems began operating in December 1997. The OU1 O&M began in 1998. In August 1998, the O&M of OU1 was turned over to the CTDEP. The implementation of each component of the remedy is described below.

4.2.1 Decontamination, Demolition, Backfilling, Compaction, and Grading

According to the Remedial Action Report (Foster Wheeler 1999), approximately 15 acres of industrial buildings were demolished, and most of the demolition materials were disposed of on-site. Metal materials were decontaminated and recycled when possible. Sub-grade improvements were completed, including compaction of the subsurface within the building pod areas to increase the ability to support building loads. The existing storm water system was excavated, the piping removed or crushed in place, and the areas backfilled. Storm water quality units were installed. The residential and Wooster School waste soils and remaining demolition material were spread across the OU1 property and stabilized. The gas vent sand layer and gas collection piping was installed, and provisions were made for the installation of the NAPL wells and piping and the groundwater monitoring wells. Compaction and grading were performed according to design. The compaction and grading were intended for redevelopment

potential. Backfill and bedding materials were brought to the OU1 property and graded according to design.

4.2.2 Cap Construction

The ROD provided for construction of a multi-layered, impermeable cap to prevent potential human contact with the on-site soil-waste contaminants and prevent further contaminant leaching into groundwater from precipitation. An impermeable cap layer was constructed over the 33.4-acre OU1 property above a soil gas collection sand layer. The cap unit substantially raised the site elevation. The entire surface of the OU1 property outside the building pod areas was covered with grass or pavement.

The impermeable layer consists of a geo-synthetic clay liner (GCL), a linear low-density polyethylene flexible membrane liner, and a geo-composite drainage layer. The impermeable liner layer was designed with utility corridor trenches for storm drainage piping and future utility installation. Storm drainage piping was installed in trenches above the impermeable liner layer, to drain cap surface water to a collection area for pumping into the storm drain system.

4.2.3 Removal of NAPL

As described in the ROD, the remedy was to include removal of NAPL to the reasonable extent practicable and send it off-site. NAPL was to be measured and removed from the two existing on-site monitoring well clusters. If successful, removal would continue until the wells were decommissioned during capping activities, and then new recovery wells would be constructed. According to the Remedial Action Report, the two monitoring well clusters were pumped to remove NAPL during the demolition phase, and the information from this removal was used in the design of the currently installed NAPL extraction system.

The NAPL extraction system was constructed in the western portion of the OU1 property (See Figure 3-2) where the concentrations of VOC contaminants were greater than 1 percent of the solubility limit in groundwater. The system consisted of five extraction wells with dedicated pumps, conveyance piping, and a storage tank with secondary containment in the West Treatment Building. The storage tank was protected by a dry chemical fire suppression system. In 2004, a small hole, caused by corrosion from the low pH of the tank contents, was discovered in the storage tank and the operation of the NAPL recovery system was suspended. In

June 2005, the NAPL storage tank was replaced with a 1,000-gallon fiberglass-reinforced plastic tank and the operation of the NAPL recovery system was resumed. The system is operated manually and has been functioning as designed.

Since the construction of the NAPL extraction system, NAPL recovery has been low, and only one well, RW-3, has actually produced any NAPL. In the past five years, despite the installation of the replacement solar power pump in 2006, minimal NAPL has been extracted from RW-3. Since the last NAPL well development was performed in 2001, CTDEP is anticipating performing well redevelopment to optimize NAPL recovery; further evaluation of the NAPL recovery system by EPA will occur during the OU2-Groundwater FS.

4.2.4 Soil Gas Collection

The western and eastern soil gas collection (SGC) and eastern enhanced soil gas collection (ESGC) systems control VOC emissions from the materials beneath the cap to prevent vapor migration off-site or into future on-site buildings and to prevent damage to the geotextile membranes in the cap. In order to control VOC emissions released from the waste materials beneath the cap, the soil gas collection systems collect the gases that build up beneath the cap's hydraulic barrier and convey them to the treatment buildings. Soil gases are gathered using blowers to provide a vacuum on piping systems installed in a gas vent sand layer. To verify that the systems are operating effectively, fourteen vacuum monitoring wells were installed. The relative vacuum in the gas vent sand layer in the SGC system is monitored using these vacuum monitoring wells to verify a negative pressure under the cap. The negative pressure under the cap effectively prevents potential soil vapor intrusion into buildings constructed over the cap.

The SGC system consists of 11 collection zones containing perforated piping in the gas vent sand layer and conveyance piping to deliver the collected gases to the East or West Treatment Buildings. Each zone pipe has a drip leg to collect water that condenses in the pipe. The drip legs are checked weekly and pumped out as needed. Approximately 90 gallons of liquid are collected every 3 months. Any water that is collected is discharged into the on-site sanitary sewer. This is performed as per a Connecticut General Permit for the *Discharge of Groundwater to a Sanitary Sewer* dated August 13, 1996. The permit requires quarterly sampling and the results are sent to CTDEP, as well as the Stratford Waste Authority.

The West Treatment Building contains the process equipment, instruments, and controls for the western portion of the SGC system (as well as for the NAPL collection system). Gases delivered to the West Building originally were treated with granular activated carbon prior to discharge. However, because concentrations of VOCs were below Maximum Allowable Stack Concentration (MASC) limits during almost 10 years of data collection, the carbon treatment was discontinued in April 2004 and now collected gases are discharged directly to the atmosphere.

The East Treatment Building contains the process equipment, instruments, and controls for the eastern portion of the SGC system (as well as for the ESGC system). A thermal oxidizer (Therm-ox) was originally used to treat (burn) the collected gases at the East Treatment Building prior to discharge to the air. In May 2005, CTDEP replaced the Therm-ox unit with six activated carbon units to capture soil gas vapors prior to discharge. The granulated activated carbon offered the same performance at a substantial cost savings. In January 2010, this carbon system was also taken offline in the East Treatment Building because influent soil gas vapor levels were non-detect and no toluene odor was present. The SGC system, however, has been operated continuously.

The change at the West Treatment Building from the carbon treatment to no treatment prior to discharge and the change at the East Treatment Building from the Therm-ox to carbon treatment to no treatment prior to discharge were made with the knowledge of the CTDEP and the EPA Project Manager. Some of these changes have been formally documented as amendments to the O&M Manual and concurred with by EPA. See Appendix E.

4.2.5 Enhanced Soil Gas Collection System

The ESGC system was constructed in the northeastern part of the OU1 property in the area of the historical toluene spill. The ESGC system consists of 12 wells and conveyance piping is connected to the East Treatment Building. Vacuum is applied to the wells. Air is injected into some collection points to provide make-up air to the subsurface. In the spring of 2006, blower B-6 was taken offline and the ESGC cycling changed from monthly to every other month to reduce energy usage and costs. In 2007, a new screen system was installed in the moisture

separators for blowers B-1, B-2, B-3, and B-5. Additionally, in the summer of 2007, bearings were replaced on all blowers.

As noted above, a thermal oxidizer (Therm-ox) was originally used to treat (burn) the collected gases at the East Treatment Building prior to discharge to the air; the Therm-ox unit was replaced with activated carbon units to capture soil gas vapors prior to discharge; and in January 2010, this carbon treatment system was also taken offline. The decision to discharge directly to the atmosphere for the East Building has been documented as an addendum in the O&M Manual.

4.2.6 Institutional Controls

As part of the clean-up approach for OU1 at the Site, there is an ELUR on the property to protect the integrity of the cap. This ELUR restriction prohibits excavation greater than 18 inches in depth or within 18 inches of any surface expression of the remedy without written approval from the Commissioner of CTDEP and EPA. Formal approval must be requested and design drawings must show the location of all subsurface features. The ELUR is recorded on the land records for the entire OU1 property. It carries a fine of up to $25,000 per day per violation. The ELUR is protective of the cap because with the final site grading, all subsurface components of the cap are greater than 2 feet below ground surface (bgs). Further, there is a warning layer (an “orange layer”) approximately 8 inches above the cap that will remind persons to stop digging in that area if the orange layer is exposed.

The ELUR on the OU1 property also prohibits activities such as: residential use, erecting a building or structure outside the building pods, planting trees that could compromise the integrity of the cap, exceeding load limits on-site, erection of any structure that could restrict access to the treatment buildings, installation of wells or borings, open burning, auto repair or service establishment, gasoline station, car wash, dry cleaners, TSD facility, collection, storage, use or handling of hazardous substances including household hazardous waste, and repackaging of cleaning materials, and/or any activity which could compromise the integrity of the cap.

According to Ronald Curran of the CTDEP, the 2010 conversion of the former Shaws building to ShopRite was overseen by CTDEP and performed in compliance with the ELUR.

4.2.7 Operation and Maintenance/Monitoring Activities

Because contaminants remain on-site, long-term groundwater and storm water monitoring are included in the remedy as described in the ROD. Monitoring of the cap cover, NAPL collection system, and soil gas collection systems are also performed as part of the O&M of the remedy.

Groundwater sampling and monitoring began in 1995 by EPA prior to the construction of the shopping center. EPA transferred oversight authority for the groundwater sampling at OU1 and the other O&M activities to CTDEP in late 1998.

To meet its O&M responsibilities, CTDEP hired a consulting firm to perform the routine sampling, inspection, and monitoring tasks. According to Ronald Curran of the CTDEP, the cost for this work, exclusive of CTDEP staff costs, is approximately $260,000 annually. A summary of the system operations and O&M costs from 2005 to 2010 are shown in the table below.

Year		Scope of Work Estimate ($)	Actual O&M Cost ($)	Analytical Cost ($)	Total Cost (S)*
From	To				
2005	2006	257,000	250,000	9,000	259,000
2006	2007	308,000	292,000	15,000	307,000**
2007	2008	276,000	253,000	8,000	261,000
2008	2009	295,000	252,000	5,000	257,000
2009	2010	288,000	218,000	16,000	234,000

* Does not include cost for electric power to operate the treatment systems which is billed directly to CTDEP.

** Does not include $90,000 for repair of the sump pump cable damaged during installation of an electrical pole on June 6, 2006.

CTDEP also developed agreements with the property owner and tenants for them to maintain and inspect certain aspects of the property. These agreements and the Site O&M activities are described in Section 4.3.

As part of capping OU1, 53 post-closure groundwater monitoring wells were installed in 16 well clusters throughout OU1 (see Figure 3-5). However, one well (PC-2M) is no longer functional because a bladder pump is lodged into the well; therefore, there are only 52 functional wells. The purpose of the monitoring, according to the ROD, was to check the cap effectiveness, the

quality of groundwater leaving the Facility, and potential impacts to down-gradient groundwater. As stated in the O&M Manual (Foster Wheeler 1998), each well cluster consists of up to four wells of different depths—a shallow well, deep well, bedrock well, and in some cases an intermediate-depth well. Any wells that existed before OU1 were capped, decommissioned, and/or removed as part of the demolition activities prior to capping.

According to the O&M Manual, the new well locations were selected based on numerous factors, including historical groundwater contamination data, elevated levels of SVOCs and metals, the presence of NAPLs, and migration pathways. In addition, wells were located at the perimeter of OU1 in order to monitor groundwater flowing off of, and on to, OU1. The O&M Manual contains a recommended groundwater sampling schedule for OU1. However, based on sampling data and monetary factors, CTDEP has made a few modifications to the sampling schedule. This change from quarterly to semi-annual sampling was a CTDEP decision made in agreement with EPA. The following is a summary of the schedule:

Current Practice:

Semi-annually
Sampling of 12 wells (10 clusters: 9 shallow wells, one intermediate, two deep) for VOCs

Annually
Sampling of all 52 functional wells (all 16 clusters) for VOCs
Sampling of 7 wells (Clusters 15 and 16) for SVOCs
Sampling of 3 wells (Cluster 02) for PCBs

Every Five Years
Sampling of the 52 functional wells for VOCs, SVOCs, PCBs, and metals

This schedule for long-term groundwater monitoring is consistent with the EPA guidance for the Optimization Groundwater Monitoring (40 CFR 265 RCRA Subpart F).

EPA conducted groundwater sampling in December 1997 in all 53 wells and in November 1998 in selected wells. Subsequent sampling has been the responsibility of CTDEP. According to the Draft Initial Post-Remediation Groundwater Monitoring Report (M&E 1999), sampling was

conducted in accordance with the Post Remediation Groundwater Monitoring Work Plan that was approved by CTDEP. The sampling round in August 1999 was considered the annual sampling event. Sampling for VOCs, SVOCs, and PCBs was performed at the wells recommended in the O&M Manual.

The next sampling event was a quarterly sampling event in April, 2000, for VOCs at 12 wells designated by CTDEP (2 fewer than the 14 recommended in the O&M manual). Half of these wells sampled were those recommended in the O&M Manual, and half were not. Nine were shallow wells, one was intermediate, and two were deep. These 12 designated wells were sampled quarterly for VOCs through January 2003 and then semi-annually in October 2003 and 2004. In addition to the annual sampling conducted in August 1999, annual sampling events took place in April 2001; July 2002; April 2003; and April 2004. There was no annual sampling event in 2000. Sampling for VOCs, SVOCs, and PCBs was performed at the wells recommended in the O&M Manual. Following the second five-year review, VOCs sampling occurred annually in 2005, 2006, 2007, 2008, and 2009. According to CTDEP, they also plan to further reduce the frequency of sampling in the near future. Any changes that CTDEP makes to the sampling program will be appended to Section 12.0 of the O&M manual.

According to CTDEP, the current semi-annual monitoring does not provide any additional valuable information that would be missed by a recommended reduction in frequency and/or method. Therefore, CTDEP plans to reduce the frequency of sampling to the following schedule:

Recommendation:

Every 9 months

Sampling of 12 wells (10 clusters: 9 shallow wells, one intermediate, two deep) for VOCs

Every Five Years

Sampling of the 52 functional wells for VOCs, SVOCs, PCBs, and metals

Five-year sampling events were performed following the second five-year review between the 2005 and 2009 time period. Sampling of all 52 functional wells was performed for VOCs, SVOCs, PCBs, and metals, as recommended in the O&M Manual. The sampling events included

measurement of water table elevations, as well as sample collection and analysis. These activities were performed and the results were presented in the CTDEP Post-Remediation Groundwater Monitoring Five-Year Review Report for each sampling event. The report included discussion of groundwater sample analytical results (See Sections 6.4.1 and 6.4.2).

Additionally, the groundwater monitored down-gradient of the OU1 property has been performed as part of the OU1 five-year review. Monitoring wells located down-gradient of the OU1 site are currently monitored every five years by EPA.

4.2.8 Five-Year Reviews

A five-year review of OU1 is required because hazardous waste contamination remains at OU1 above levels that allow for unlimited use and unrestricted exposure. This is the third five-year review for OU1.

4.3 Operation and Maintenance

The components of the selected remedy that are ongoing at OU1 include ensuring the long-term integrity of the cap, maintaining the storm water system, operating the soil gas collection systems and NAPL extraction system, and routine groundwater and storm water monitoring. These components require on-going maintenance to remain operational. A maintenance and inspection schedule has been developed by CTDEP to ensure that systems at OU1 remain operational and the remedy remains protective of human health and the environment. Sub-systems associated with these components are operated and monitored from the West and East Treatment Buildings on-site, and include the following, as described in Section 2.0 of the Final O&M Manual (Foster Wheeler 1998) and/or as documented in the O&M Manual as an addendum to Section 12:

- OU1 grounds including fencing, paving, and landscaping (Section 4.3.1);
- Storm water system including the liner system water collection sumps (Section 4.3.2);
- Soil gas collection (SGC) system including the piping system, blowers, condensate collection system, drip legs, and vacuum monitoring points (Section 4.3.3);

- Enhanced soil gas collection (ESGC) system including the piping, air injection blowers, off-gas blowers, and condensate collection system (Section 4.3.3);

- Dense non-aqueous phase liquid (NAPL) pumping system including well head vaults, piping, NAPL storage tank, and associated pumping and monitoring devices (Section 4.3.4);

- Groundwater post-closure monitoring wells (Section 4.3.5); and

- Treatment buildings (Section 4.3.6).

The activities described in the O&M Manual are summarized below. More detailed discussion of the activities performed by CTDEP and their consultants is contained in Section 6.5, Site Inspection. One critical component of the OU1 remedy is the ELUR that is recorded on the property land records. The ELUR protects against cap breaches and maintains the integrity of the OU1 remedy.

CTDEP O&M changes are incorporated into Section 12.0 of the O&M manual. A summary of CTDEP changes to date is presented in Appendix E.

4.3.1 Site Grounds

As detailed in the O&M Manual, CTDEP and its consultant, AECOM, perform inspections of the cap pavement, vegetation, and perimeter fence to verify that they are intact and that the integrity of the cap has not been compromised through weathering, settlement, plants, animals, or man-made intrusions. Any compromised areas are repaired or replaced.

Hoffman Engineering, the consultant for the property management firm, also performs monthly inspections of the shopping center. The consultant inspects the inside of the stores for floor loads, spill kits, grease traps, housekeeping, etc. These completed inspection forms are provided to CTDEP quarterly. Hoffman Engineering has direct contact with the CTDEP Project Manager, Ronald Curran.

During the Nobis Engineering site visit for this five-year review in May 2010, no issues related to fencing, paving, or landscaping were identified.

4.3.2 Storm Water Runoff

The remedy as described in the ROD included a storm water monitoring component. Since almost the entire OU1 property is either paved or under a building, water management is a concern during a rain event. The storm water system collects surface water runoff through catch basins and trench drains and conveys the collected runoff to on-site gross-particle/oil water separators before discharge to the Connecticut Department of Transportation (CTDOT) drainage system and Ferry Creek. Four sumps along the boundary of OU1 collect subsurface water that runs off the top of the cap liner. Water in these sumps is pumped directly into an adjacent storm sewer. Surface water run-off from the cap cover and infiltration channeled by the drainage layer within the cap can be sampled to assess the quality of the water discharging to the storm drain.

The consultant for the property management firm conducts monthly inspections of the property, primarily to inspect the external portions of the buildings and to inspect the storm water drainage system basins. The latter inspection must be conducted at least semi-annually as required under the storm water permit. If the storm water basins are filled with grit (a subjective evaluation), then the basins are cleaned out by a pumping company and the grit removed. The permit also requires the storm water and grit separator (Stormceptor) units be inspected twice per year in spring and fall and cleaned if necessary. The O&M manual specifies the maximum amount of grit permissible based on the size of the unit (not a subjective evaluation).

4.3.3 Soil Gas Collection (SGC) Systems

As detailed in the O&M Manual, CTDEP and its consultant, AECOM, routinely perform maintenance and inspection of the site surface, pavement, vegetation, buildings, SGC collection piping, drip legs, air blowers, condensate storage tanks, and vacuum monitoring wells.

The collection of the vapors that develop under the cap is critical to maintaining the cap integrity as well as to prevent migration of vapors into nearby buildings. Elaborate piping systems were installed across OU1 to facilitate the removal of vapors. Currently, the removed vapors are piped into one of the two treatment buildings prior to release to the atmosphere, as described

previously in Section 4.2.4. To determine if the SGC systems are working effectively and preventing VOC backup under the cap, fourteen vacuum monitoring wells were installed on OU1. By monitoring the relative vacuum exerted by the system in the gas vent sand layer, the system can be monitored to verify a negative pressure under the cap and therefore continuously tested for effectiveness.

4.3.4 NAPL Recovery Wells

As detailed in the O&M Manual, CTDEP and its consultant, AECOM, maintain and routinely inspect the NAPL extraction wells and conveyance piping, including the extraction pumps, storage tank, and dry chemical fire suppression system. The extraction wells and storage tank are sampled regularly (see O&M manual for schedule). The system had been off-line from 2004 to early 2005 because of a small leak in the recovery storage tank caused by the acidic pH of the tank contents, which was detected during a routine inspection of the recovery tank. The tank was replaced and the NAPL system was put back on-line in June 2005. The pump in RW-3 was replaced with a solar powered pump in June 2006. The NAPL system is inspected on a routine basis as follows: weekly checks of recovery wells, piping, and storage tank; monthly checks of NAPL level in tank as well as cleaning of pumps and sensors.

The design of the NAPL well allows the collection of up to 5 feet of NAPL in the sump portion of the well. The NAPL pump is located near the bottom of the 5-foot sump. NAPL is allowed to passively collect in the sump due to the density differences between water and the NAPL. However, if the conductivity sensors in the NAPL recovery wells become coated with NAPL thereby masking the water/NAPL interface, the NAPL pumps can be operated manually. The manual operation of the DNAPL pump does not affect the effectiveness of the system. The pump is energized monthly to extract any NAPL that has been collected in the well.

The NAPL extraction system is effective at removing NAPL to the reasonable extent practicable, which is the design parameter for the system. Since the construction of the NAPL extraction system (1997), NAPL recovery has been minimal. To optimize NAPL recovery, CTDEP is planning to redevelop this well. The NAPL recovery system and groundwater contamination migrating from OU1 will be evaluated by EPA in the Raymark OU2-Groundwater FS.

4.3.5 Post-Closure Monitoring Wells

The maintenance and inspection of the post-closure monitoring wells, including well redevelopment procedures and the sampling of groundwater according to schedule and procedures is described in O&M Manual. CTDEP has reduced the sampling frequency in consultation with EPA. These changes are documented in an addendum to the O&M Manual. Further planned changes still need to be addressed in the manual. See discussion of monitoring activities in Section 4.2.7 for details about groundwater sampling schedule. See also Section 6.4.2 for groundwater sampling analytical results.

4.3.6 Treatment Buildings

CTDEP and its consultant, AECOM, perform routine site inspections, including the treatment buildings—both as part of the treatment systems and as stand-alone structures. The inspections include observing the conditions of the buildings and their systems for security, power, fire suppression, telephone, lighting, and control center for all on-site treatment processes. These inspections are recorded on the weekly, monthly, and quarterly inspection forms by CTDEP and/or its consultant.

The construction of the Webster Bank in 2005 provided the opportunity to bring water and sewer services to the West Treatment Building. The facility was upgraded with water and sewer services and an emergency shower and eyewash station. The fan and thermostat in the West Treatment Building were also replaced in June 2009.

In the East Treatment Building, the building door alarm magnet was replaced in October 2007. In both the East and the West Treatment Buildings, the Programmable Logic Control (PLC) System alarm display units were replaced in 2005. This is an alarm auto-dialer in the treatment buildings, which is used to alert CTDEP staff remotely in the event there is a system problem. Alarm codes for various events such as fire or equipment alarm/failure are documented in the O&M Manual. After an alarm has been activated, a CTDEP contractor will go to the OU1 property within 24 hours to determine whether everything is working properly with the system and treatment buildings. Additionally, a Call Before You Dig (CYBD) notification system was added to the OU1 remedy in June 2006 after an electrical incident.

Local officials do not tour the buildings or property regularly; most local officials are only on-site to inspect based on a specific request or change.

5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

The OU1 property is in the O&M phase of its remedial action. Construction of the OU1 source control remedy components is complete; the property has been successfully re-developed; institutional controls are in place and are effective in controlling exposures; responsibility for O&M has been transferred to the state and its contractors; and soil gas collection and groundwater monitoring are occurring. NAPL recovery is functioning as designed, however, NAPL recovery is minimal and well redevelopment is suggested to optimize its effectiveness. All other components of the OU1 remedy are functioning as expected. O&M, including groundwater monitoring, is expected to continue for many years. Significant changes in groundwater contaminant concentrations beneath OU1 are not expected. No new issues have arisen.

As stated in the second five-year review, the remedy at OU1 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled. The second five-year review found no substantial areas of noncompliance with the remedial objectives, but it noted several minor areas of discrepancy and made recommendations in some of the areas. These issues and recommendations are presented below. The progress made on each issue over the last five years is noted below the issue, with current updates from this five-year review cycle.

- **Issue/Recommendation 1:** A written contingency plan has not been prepared as required under 40 CFR 265 RCRA Subpart D; although there is an "informal" chain of command that primarily involves the CTDEP on-site Project Manager (Ronald Curran) in the event there are problems or issues on the OU1 property that need immediate attention. Recommendation: Develop a written contingency plan.

  Progress: A written contingency plan was developed for OU1. Pursuant to RCRA Subpart D, the contingency plan describes the actions to be taken in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous substances. The plan also includes hazardous waste management provisions and an agreement coordinating emergency procedures between local police and fire departments,

hospitals, contractors, and state and local emergency teams. Additionally, this plan includes an evacuation procedure for facilities on OU1 and a list of all emergency equipment at the Facility. A chain of command was also created and documents a hierarchy of individuals who will be responsible for the OU1 property in an emergency. This issue will no longer remain an issue for this five-year review.

- **Issue/Recommendation 2:** A groundwater monitoring sampling plan and the associated groundwater monitoring are not being followed/performed as comprehensively as required in 40 CFR 265 RCRA Subpart F, nor is groundwater sampling being performed on the schedule identified in the state/EPA superfund contract. Recommendation: The revised sampling program should be reviewed and concurred with by EPA.

  Progress: CTDEP provided documentation of their sampling program for inclusion into the O&M manual for the OU1 property (see Appendix E). These changes were appended to Section 12.0 of the O&M Manual.

  CTDEP is planning further changes to reduce the frequency of sampling. Semi-annual sampling for VOCs is proposed to be reduced to every 9 months, and the annual sampling eliminated. Comprehensive sampling would still be performed every 5 years. This will save CTDEP costs, and the 9-month schedule will allow for sampling during all seasons, but it will also reduce the comparability of data over time due to the seasonal variation.

  There is no direct impact to human health or the environment from the changes/differences in groundwater sampling, as there are no receptors drinking the water and sub-slab depressurization systems have been installed in down-gradient homes within OU2 (groundwater) that prevent intrusion of vapors from contaminated groundwater.

  Trends in groundwater contaminant levels have continued to be evaluated and reported according to the O&M Manual with the variations noted above**.** Appendix E provides the documentation of the changes made to date by CTDEP to the O&M Manual. The O&M Manual and its updates provide documentation on the continuing oversight of OU1. All changes to sampling procedures are documented as amendments to the O&M Manual.

Section 12.0 of the O&M Manual indicates the process to be followed. EPA reviewed and approved the sampling program changes made by CTDEP. This issue will no longer remain an issue for this five-year review.

- **Issue/Recommendation 3:** Only one recovery well, RW-3, is actually removing NAPL. Recommendation: EPA/CTDEP conduct an assessment, including well redevelopment, to determine whether pumping RW-3 should be discontinued or whether continued efforts to improve recovery would be useful.

  Progress: Recovery wells at OU1 are operating as designed, however the wells are recovering minimal amounts of NAPL. Currently, the amount of NAPL recovered from RW-3 has continued to be low, and none has been found in the other wells. A new solar powered pump for RW-3 was installed in June 2006, which has not made any significant changes to NAPL recovery.

  Because significant on-site resources are used to sample NAPL, the utility of continuing this effort with the current well configuration has been discussed with CTDEP. Further, it is questionable whether the system as it currently exists is cost-effective given the small amount of NAPL that has been removed over the past 13 years.

  To address this issue, CTDEP has stated that well redevelopment is proposed to occur. They have agreed to redevelop the recovery well to optimize NAPL recovery. CTDEP currently plans to continue to maintain the NAPL recovery system until there is a ground water (OU2) remedy selected. When EPA begins work on the OU2-Groundwater FS, this effort will encompass both on-property ground water contamination, including the NAPL recovery system, as well as the off-property plume. However, the effectiveness of the NAPL recovery wells will remain an issue for this five-year review.

- **Issue/Recommendation 4:** Soil gas from SGC and ESGC systems is not being treated as specified in the O&M Manual. Recommendation: Document the current soil gas treatment program for inclusion into the O&M manual for the OU1 property. Changes should be reviewed and concurred with by EPA.

- **Progress:** Vapors from OU1 are collected in on-site treatment systems prior to release. CTDEP states that the contaminant concentrations in influent soil gas are below treatment standards. As a result, in May 2005, CTDEP discontinued treatment of soil gas with the thermal oxidation unit in the East Treatment Building. Use of the thermal oxidation unit was expensive, and treatment was deemed unnecessary because discharge concentrations were below State of CT allowable limits. Because of odor problems from toluene in the discharged air, the thermal oxidation unit was replaced with carbon units to capture the soil gas. In January, 2010, use of the granulated activated carbon units were also taken offline in the East Treatment Building because influent soil gas vapor levels were non-detect and there was no odor problem. The use of the carbon units in the West Treatment Building was discontinued in 2004 because VOC discharge concentrations were also below State of CT allowable limits. Therefore, collected vapor concentrations from both treatment buildings are now released untreated directly to the atmosphere.

  To determine if the SGC systems are working effectively and preventing VOC backup under the cap, fourteen vacuum monitoring wells were installed on OU1. The parameter vacuum monitoring wells are located near the center of each zone, beyond the reach of the soil gas collection piping. If a negative pressure exists, all soil gas is drawn to the collection pipes.

  A negative pressure is consistently recorded at each vacuum monitoring point. CTDEP has monitored the pressures in the soil gas collection system and these negative pressures verify that the vacuum is transmitted under the entire cap, even if one of the treatment buildings goes off-line. Monitoring of the negative pressures in the soil gas collection system indicate that the system is effectively preventing potential vapor intrusion into buildings constructed over the cap.

  CTDEP has provided the documentation of the changes in vapor treatment in the East and West Treatment Buildings identified in the second five-year review to the O&M manual for OU1 (see Appendix E). These changes were appended to Section 12.0 of the O&M Manual. The changes have been reviewed and approved by EPA.

The 2010 decision to discontinue carbon treatment at the East Treatment Building has been documented as an addendum to the O&M Manual. Appendix E shows all the documented changes made to the systems to date. EPA has reviewed and approved the changes and provided input to CTDEP. This issue will no longer remain an issue for this five-year review.

6.0 FIVE-YEAR REVIEW PROCESS

This section provides a summary of the five-year review process and the actions taken by EPA to complete the review.

6.1 Administrative Components

EPA, the lead agency for this five-year review, notified officials in the Town of Stratford on May 24, 2010 that the five-year review would be conducted. EPA issued a scope of work, Task Order No. 0054-FR-FE-01H3, under EPA RAC 1 Contract No. EP-S1-06-03 for Nobis Engineering to assist EPA in performing the five-year review. The Task Order Project Manager is Ronald Jennings. Ronald Curran, of the CTDEP, was part of the review team. The schedule established by EPA included completion of the review by September 2010.

6.2 Community Notification and Involvement

Town officials were notified of the upcoming five-year review on May 24, 2010. The initial public announcement of the third five-year review was made by EPA staff in a public notification. This notification, announcing the five-year review, was sent to the Connecticut Post, a local newspaper, on Thursday, August 12, 2010 (see Appendix A for notification).

6.3 Document Review

This five-year review included a review of relevant documents including the 1995 ROD, the O&M Manual, the Remedial Action Report, and periodic Post-Remediation Groundwater Monitoring Five-Year Review Report. The documents reviewed are listed in Appendix B.

The list of ARARs (Appendix D) was also reviewed for changes that might affect the protectiveness of the remedy. Based on input from Ronald Jennings (EPA) and Ronald Curran

(CTDEP), there are no changes in ARARs that affect the protectiveness of the remedy. Ronald Curran indicated that the remedy continues to comply with Connecticut requirements.

6.4 Data Review

As stated in the ROD, the groundwater beneath the former Raymark Facility was to be sampled and analyzed to monitor the effectiveness of the cap, the quality of the groundwater leaving the Facility, and potential impacts to the down-gradient groundwater. For this five-year review, the groundwater monitoring data were evaluated in order to assess cap effectiveness. The potential impacts to down-gradient groundwater are assessed in the OU2 RI (TtNUS 2005). The data reviewed for this five-year review included:

- VOCs, SVOCs, and PCB data from groundwater samples collected by EPA from all 53 wells from quarterly, semiannually, annual, and five-year sampling rounds;

- Water table elevation measurements, as well as sample collection and analysis were also performed and reported in post-remediation groundwater monitoring reports addressing groundwater flow directions and groundwater sample analytical results;

- Groundwater flow data presented in OU2 RI Report; and

- CTDEP quarterly, annual, and semiannual reports.

6.4.1 Groundwater Flow

The movement of groundwater beneath the former Raymark Facility and the surrounding area was evaluated in the Raymark OU2 RI report (TtNUS 2005). According to the RI report, shallow groundwater beneath the northern end of the Facility flows to the east toward the Housatonic River. Shallow groundwater beneath the central and southern portions of the Facility flows to the southeast, and most of this groundwater also discharges to the Housatonic River. Only the shallow groundwater beneath the extreme southern end of the facility flows south toward Ferry Creek. The shallow groundwater flows very slowly beneath the northern end of the Facility, and it flows much faster beneath the southern end of OU1.

6.4.2 Groundwater Monitoring Analytical Results

Trends in groundwater contaminants were evaluated in the quarterly, annual, and semi-annual reports prepared for CTDEP. The groundwater monitoring reports generally indicated that VOC levels were "relatively stable" and "relatively consistent" with previous sampling events at most locations. However, VOCs at some wells had increased or decreased significantly from previous samplings. Low concentrations of metals were detected in all of the post-closure monitoring wells in the 2005 to 2009 five-year review sampling events. PCBs were not detected in any of the sampling events. SVOCs levels were stable and consistent with previous sampling events, excluding post-closure monitoring well 11S in 2007. This post-closure monitoring well has not been historically high for SVOCs, but recent sampling showed a spike in concentrations. Turbidity at the time of sampling was higher than the sampling standard for low-flow groundwater monitoring well measurements, suggesting entrained sediments in the sample. All of the reports highlighted significant changes at particular wells and presented selected temporal trend plots along with a complete set of analytical results.

VOC Analysis

For this five-year review, EPA and its consultant, Nobis Engineering, performed a trend analysis to evaluate changes in VOC concentrations from 1995 through 2009. The reported groundwater monitoring data for six VOCs were grouped by well cluster, and trends in the annual sampling data for each well depth in each cluster were evaluated by identifying and comparing the maximum concentration of each VOC detected during each five-year review period. In general, only the data collected during the annual sampling events were included in the evaluation; however, in order to incorporate the most recent available data into the review, the November 2009 data also was included for the 12 wells sampled in that event. The six VOCs evaluated in the trend analysis were: chlorobenzene, 1,1-dichloroethene (1,1-DCE), toluene, 1,1,1-trichloroethane (1,1,1-TCA), trichloroethylene (TCE), and vinyl chloride. These VOCs were selected because they occur at high concentrations in the groundwater beneath OU1, and in the past they were detected in the indoor air in homes located over contaminated down-gradient groundwater. A trend analysis is summarized below. A more in-depth analysis of groundwater trends is presented in the OU2 RI (TtNUS 2005).

In order to focus on the most significant levels of contamination, only VOCs with reported concentrations greater than 100 µg/L in at least one well in a given cluster were included in the

analysis. The data, collected by AECOM on behalf of CTDEP for the six VOCs, is summarized on Table 6-1. Figure 6-1 presents temporal trend plots for each cluster of wells: shallow overburden (S) (Figure 6-2), intermediate overburden (M) (Figure 6-3), deep overburden (D) (Figure 6-4), and bedrock (B) (Figure 6-5). The locations of the well clusters are shown on Figure 3-5.

As shown on Figure 6-1, the temporal trends in the six VOCs detected in the shallow (S) wells appear to be consistent with the conclusion that the cap is effectively preventing surface water from penetrating and leaching contaminants from the vadose zone. The VOC concentrations were non-detected (ND) or very low at most of the S wells over the evaluated time period. In cases where VOCs were detected at high levels in the S wells between 1997 and 2004, most showed a lower concentration in the most recent period. For example, in PC-4S the concentration of chlorobenzene decreased from 1,270 µg/L in 1999 to 340 µg/L in 2006. PC-9S showed 1,1,1-TCA decreasing from 16,900 µg/L in the 2000 to 2004 time period to 650 µg/L in most recent sampling events.

Generally, VOC levels either remained constant or fluctuated in shallow post-closure monitoring wells, including PC-12S and PC-9S for vinyl chloride, PC-14S and PC-3S for chlorobenzene, and PC-4S for toluene, which showed the highest concentration of toluene. Cases where VOC levels rose in shallow post-closure wells were the exception. TCE was detected at 89.2 µg/L in PC-10S in 1999 and remained relatively stable for the sampling event in 2002; however, this contaminant increased significantly to 1,300 µg/L in 2006.

In the intermediate (M), deep (D), and bedrock (B) wells, consistently low concentrations or downward trends are seen for the six VOCs at all depths in clusters PC-5, PC-11, and PC-16. At the remaining clusters, there is considerable variability among the depths over time. VOC concentrations were determined to be very high at several wells. In some cases, the concentration of a VOC in a cluster decreased over time at one depth, but increased at another.

PC-1, PC-2, and PC-9 are on the lower southeastern perimeter of OU1. Overall, PC-2 and PC-9 showed most contaminant levels increasing, as well as detected the most contaminants over 100 µg/L.

At PC-2, near the southeastern perimeter of OU1, 1,1,1-TCA and 1,1-DCE were very high at all depths except S in 1997. Currently, concentrations of 1,1,1-TCA and 1,1-DCE generally have fluctuated, but remain high. There is a suspected 1,1,1-TCA-rich and 1,1-DCE-rich NAPL source in the deep overburden and shallow bedrock near the PC-2 well cluster (TtNUS 2005). PC-2B currently has the highest concentration of 1,1-DCE at 35,000 µg/L. At PC-2M and PC-1M, the chlorobenzene concentrations also rose sequentially in each period evaluated.

PC-9D presently shows the highest level of 1,1,1-TCA contamination at 2,200 µg/L. PC-9S detected the highest contaminant concentration of vinyl chloride at 310 µg/L. TCE and 1,1-DCE levels at this well cluster are also are high, but have fluctuated over the various time periods.

Along the eastern perimeter of OU1, post-closure monitoring wells show high levels of chlorobenzene and toluene contamination. At PC-3, chlorobenzene rose to high levels (up to 7,740 µg/L) in the S and D wells, and then levels fell slightly to 5,200 µg/L in November 2009 in PC-3S. Currently, this well shows the highest level of chlorobenzene contamination.

TCE concentrations have been consistently high in wells located along the western perimeter of OU1. At PC-10, TCE levels decreased at the M depth, fluctuated at the D depth, and increased at the S and B depths. At PC-13, TCE decreased slightly at the D and S depths, fluctuated at the B depth and remained somewhat constant at the M depth. The persistence of high concentrations of TCE in the groundwater at these locations is likely the result of NAPL migration rather than infiltration-driven leaching, because the TCE concentrations are highest in the deep overburden and bedrock, and these well clusters are positioned along the up-gradient site boundary.

PC-14 and PC-15 are located near the southern end of the Facility, a short distance down-gradient from the NAPL recovery wells. TCE concentrations have tended to remain high and/or fluctuate without a clear trend in most wells. In 2009, the TCE level was 8,300 µg/L in PC-14D, which had increased since initial sampling performed in 1997; however, at PC-14B, concentrations decreased. The levels of TCE, toluene, and 1,1,1-TCA in the deep overburden at PC-14 decreased or were stable than those detected in the bedrock during the 2000 to 2004 period. At PC-15, TCE concentrations were consistently high in the bedrock, but remained low in the S and D wells. Chlorobenzene concentrations have also remained high and/or fluctuated without a clear trend in most of the wells in these two clusters. The high and/or low fluctuating

concentrations of chlorobenzene, TCE, and toluene at these locations can be attributed to their proximity to the up-gradient NAPL source. The occurrence of high concentrations of vinyl chloride can be attributed to the biodegradation of TCE along the upper margin of the plume that emanates from the NAPL source.

Farther down-gradient from the NAPL source at PC-12, TCE concentrations were somewhat variable but still remained high at the D and B depths throughout the period of record. Vinyl chloride concentrations in this well have also been fluctuating.

Metals Analysis

The metals groundwater monitoring data was evaluated in less detail than the VOCs for this five-year review. The analytical results for samples collected between the years 1997 and 2009 were reviewed for arsenic, cadmium, chromium, lead, and selenium, which were listed as groundwater contaminants of concern in the O&M Manual. The maximum contaminant concentrations detected between the years 1995 to 1999 (first five-year review), 2000 to 2004 (second five-year review) and 2005 to 2009 (third five-year review) were reviewed in this analysis. These data were collected by AECOM on behalf of CTDEP and are presented in Table 6-2.

As shown on Table 6-2, many of the metal results for samples collected between 2005 and 2009 were ND in the 52 post-closure wells sampled on OU1. Some of the 2005 to 2009 results represented increases from the prior period, but the metals concentrations for most wells declined or remained relatively stable over the five-year period. The 1997 concentrations of many metals were much higher than those observed during later periods because initial samples were collected using the standard bailer methods rather than the low flow methods, which help limit residuals caused by excessive suspended solids, used during subsequent periods.

The greatest number of metal contaminants were detected in PC-2 and PC-1, on the southeastern perimeter of the Site. Of the wells analyzed, 29 wells showed detectable levels of arsenic. The highest concentrations of arsenic for the 2009 sampling event were found in PC-2S, which remained relatively stable from previous samples.

For chromium, the highest concentration was detected in PC-2B in 2009. This concentration represents an increase from 2 µg/L in 2002 to 2,020 µg/L in the most recent sampling period.

Increases in chromium were also seen at PC-2M and D, PC-5B and D, PC-12D, PC-1B, and PC-16B. Concentrations declined, fluctuated, remained constant, or were detected at very low levels at most of the remaining wells, and many results were ND. High levels of chromium were detected in 38 wells in the 2009 sampling event.

Lead was detected in 33 of the 52 functional wells during the 2005 to 2009 sampling events, with the highest results at PC-1B and PC-1D in a 2007 sampling event. The PC-1B and PC-1D concentrations were 2,750 µg/L and 913 µg/L, respectively, while both were 20 µg/L and NA in the second sampling period. PC-8S and PC-10S lead concentrations increased from the sampling events between 2000 and 2004 (ND for both samples); however, the concentrations overall have decreased from initial sampling in 1997 and 1998.

The highest cadmium concentration detected during the recent period was 93 µg/L identified in PC-13D on the western perimeter of OU1, which had decreased from 1997. The cadmium concentration also declined significantly at PC-16M from 343 µg/L in 2002 to 57 µg/L in 2009. Most of the other cadmium levels had decreased or remained stable since the second five-year review, or they were close to the detection limit. 17 wells indicated cadmium was present in the most recent sampling event.

Selenium was ND at all wells during the 2005 to 2009 sampling period except in PC-1B, PC-1D, and PC-1S where it was detected at 1 µg/L, 1,540 µg/L, and 4 µg/L, respectively. Selenium was not detected previously in PC-1.

Groundwater Analysis Conclusions

- VOC concentrations were low in most shallow wells and either remained constant or fluctuated.

- High concentrations of VOCs persist in deeper wells. VOC concentrations were highest along the southeastern perimeter of OU1; these wells showed the most contaminant levels increasing.

- The highest concentrations of chlorobenzene and toluene were present along the eastern perimeter of OU1.

- The metals results indicate that the concentrations at most wells were relatively low, and/or they were declining or relatively stable since the 2000 to 2004 sampling events.

- The shallow groundwater data indicate that the cap is generally protective in terms of minimizing the leaching of contaminants to the groundwater from on-site vadose zone source areas.

- The small quantities of TCE-rich NAPL that have been removed from the recovery wells (see Figure 3-5), and the persistence of high TCE concentrations in source area and down-gradient post-closure wells suggests that the recovery wells may not be optimally removing the NAPL source, even if the recovery wells are functioning as designed.

- Since most contamination was highest in down-gradient wells, the contaminants are likely migrating off-site. This will be addressed in the OU2 Feasibility Study.

6.5 Site Inspection

A site inspection was conducted on May 10, 2010, with representatives from CTDEP, the O&M contractor (AECOM), and EPA's contractor (Nobis Engineering). The inspection included interviews with representatives from CTDEP and the O&M contractor; visual inspection of the cap cover; inspection of O&M logbooks; and inspection of the equipment in the East and West Treatment Buildings. The titles and organizations of the individuals, who were performing the Site inspection, as well as the Five-Year Review Site Inspection Checklist, are presented in Appendix A.

Cover Maintenance

The property is kept in good condition. Healthy trees and grass are growing around the perimeter of the OU1 property. There is a regular maintenance program in place to maintain the plantings. When asphalt cracks are discovered, they are sealed as soon as possible. If the storm water drains are filled with sediment, they are sampled and then cleaned out to prevent buildup and keep the on-site waters moving. Prior to any OU1 changes, a review of plans and an identification of the issues are determined between the CTDEP and the property owner (and/or tenant) making the request. The building approval process requires plans that identify

all components of the cap system (warning layer, pipes, post-closure monitoring wells) as well as the issues inherent to building on a property subject to ELURs. The entire OU1 property is subject to an ELUR recorded on the Stratford Land Records (Vol. 1574 pages 011 through 035).

O&M Inspections

CTDEP, their consultants, the Property Manager, and a consultant for the tenants conduct regular O&M inspections and document the results of those inspections on forms kept in notebooks in the West Treatment Building. While not every inspection form was reviewed during the May 10, 2010 site visit, a general review of the completed inspection forms was performed. Copies of the blank inspection forms are included in Appendix E.

The O&M Manual does not provide details on how often some of the inspections must occur. In the absence of clear guidance, CTDEP has developed an inspection schedule. Weekly, monthly, quarterly, and annual inspections are conducted. Between the CTDEP staff, their consultant, the Property Manager, and the consultant for the tenants on the property, there appears to be sufficient attention paid to all of the physical attributes at OU1. In the event there are problems or issues on the OU1 property that need immediate attention, Scott Gish, AECOM, or Ronald Curran, CTDEP, is contacted (contact requirements are formally documented in an emergency contingency plan).

System Operations

There are five recovery wells installed at OU1 to remove NAPL from the groundwater, but little NAPL has been recovered over the past 5 years. Only one well, RW-3, has recovered NAPL during the 13 years of system operation. In June 2005, the NAPL storage tank was replaced with a 1,000-gallon fiberglass reinforced plastic tank. In 2006, a new solar powered pump was installed in RW-3. In the past five years, despite the installation of the replacement pump, minimal NAPL has been extracted from RW-3. Future activities for well redevelopment are anticipated.

The SGC and ESGC systems appear to be functioning effectively as discussed below. VOC readings using a PID are taken of soil gas samples from the headers in the SGC and ESGC systems, and vacuum readings are taken from the vacuum monitoring wells. Monitoring of negative pressures in the soil gas collection (SGC) system indicate that the system is effectively

preventing potential vapor intrusion into buildings constructed over the cap. Back-up systems are in place in the event that certain parts break down. No substantive problems were identified by Ronald Curran (CTDEP) or Sarah Perhala (CTDEP Contractor) during their interviews (See Section 6.6).

According to Curran and Perhala, the soil gas concentration results are well below MASC limits. Accordingly, prior to the 2005 five-year review, the use of carbon to filter out the soil gas contaminants prior to discharge to the atmosphere was discontinued in the SGC system in the West Treatment Building. The soil gas concentrations from the SGC and ESGC system at the East Treatment Building were also below MASC limits, but treatment was needed due to an odor problem from toluene. The Therm-ox unit was replaced with carbon units to remove VOCs from the soil gas (including toluene) prior to discharge. In January 2010, the carbon units were also taken offline in the East Treatment Building because influent soil gas vapor levels were non-detect and no toluene odor was present.

The changes from the carbon treatment to no treatment prior to discharge at the West Treatment Building, and the change from the Therm-ox system to carbon treatment to no treatment prior to discharge at the East Treatment Building were made with the knowledge of the CTDEP and the EPA Project Manager. These changes to on-site treatment systems are documented as amendments to the O&M Manual. See Appendix E for the changes made to date.

52 of the 53 post-closure monitoring wells installed on OU1 appear to be operating effectively. In April 2008, a bladder pump became lodged in PC-2M causing this well to be the only non-functional well. The post-closure monitoring well sampling schedule and well sampling procedures have changed. All modifications are documented in Section 12 of the O&M Manual; however, a new sampling schedule has been proposed which includes reducing semi-annual sampling frequency to every nine months as well as eliminating annual sampling. Overall, the system wells are routinely sampled and are visually inspected regularly.

Environmental Land Use Restrictions

ELURs were incorporated into the deed as part of the sale of the property to Walmart Real Estate Business Trust, STFD, LLC, and Home Depot U.S.A, Inc. in February 2000. Charter,

LLC assumed ownership from STFD, LLC in 2002 and therefore the ELURs were also included in this transfer of ownership. The ELURs prohibit future activities that could result in damage to the cap or exposures to the wastes beneath the cap, or interfere with the state obligation to perform O&M activities. Details on the ELUR are presented in Section 4.2.6. The ELUR is enforced and still working. There have been no violations to ELURs or enforcement acts since the last five-year review.

An incident occurred in which a cable was damaged during excavation outside the area subject to the ELUR. The "Sump Pump Control Cable" was damaged and required replacement because of excavation to replace a pole near the intersection of Longbrook Avenue and Barnum Avenue. Following this event, the entire OU1 property was registered with "Call before you Dig" so that the CTDEP receives notice whenever any excavation is proposed within 300 feet of the OU1 property.

Permits

At the time of the 1995 ROD signing, and at the time of the transfer of O&M, there were no permits issued for OU1. Prior to site construction, a storm water permit was obtained by the site contractor; this permit was converted and reissued to the property owner once construction was complete.

CTDEP has a permit for discharge of drip leg water from the on-site emissions systems. This water is discharged to the sanitary sewer under a general permit issued to CTDEP.

6.6 Interviews

Interviews were conducted during the site inspection. Three people were interviewed: Ronald Curran (CTDEP), Sarah Perhala (AECOM), and Scott Gish (AECOM). The titles and organizations of the individuals interviewed are presented in Appendix A. The group interview was conducted during the May 10, 2010 site inspection. Other than the low recoveries in the NAPL extraction system and a non-functional post-closure monitoring well, no major problems were identified. Mr. Curran's overall assessment of the remedy was that it is protective; however, he was concerned about the aging of the on-site equipment and the ability to replace aging parts (locating and paying for them).

Based on the professional opinions of Ronald Curran, Sarah Perhala, and Scott Gish, the current OU1 remedy at the Raymark Site is protective of human health and the environment and is mainly operating as intended.

Ronald Curran, the CTDEP Project Manager, performs the routine site inspections as the "system maintainer". The contaminant levels in the monitoring system have decreased and changes in the operation of the systems have been incorporated into routine inspections. OU1 is inspected on a weekly, monthly, and a quarterly basis as agreed to in their work plan. Most of the inspections are as required on the time schedule shown in the O&M Manual, Table 2-1. All inspections are documented in the routine forms shown in Appendix E. These forms are kept in 3-ring notebooks located at the on-site treatment buildings.

Sarah Perhala is an Environmental Scientist with AECOM, who helps to coordinate and monitor OU1. She performs the inspections of the SGC systems, as well as monitors drip leg discharges. She also helps to perform OU1 site inspections.

Scott Gish is an Environmental Technician Drafter with AECOM who also helps to maintain and monitor OU1. Scott does frequent checks of the site grounds and notes any irregularities or problems. He is first to respond to any alarms that activate in the treatment buildings. If these alarms are not answered within a 15 minute time period, Ronald Curran will be contacted. These alarms can be remotely turned off or reprogrammed via phone, however, in practice, the alarms are not shut down, but the system is reset. Alarm codes for various events such as fire or equipment alarm/failure, are documented in the O&M Manual. After an alarm has been activated, Scott Gish will go to the site within 24 hours to determine the status of the system and treatment buildings. The most frequent reason the alarm sounds is for the door motion sensor due to high winds.

Prior to the interviews, a meeting was conducted on March 21, 2010 to discuss the Raymark Site, specifically redevelopment potential on various OUs throughout Stratford. Mayor John Harkins, the new Chief Administration Officer Geen Thazhampallath, and Andrea Boissevain from the Health Department were in attendance at this meeting.

Most people reacted positively at the meeting concerning the progress with the various Raymark OUs throughout the Town. There was some discussion concerning the municipal

budget and how this would impact any planning for the different uses of the various OUs. At this meeting, there was also some discussion regarding the Contract Plating property, a metal finishing company which ceased operations in 1995. The Contract Plating property is not currently a subset of the Raymark Site and is located adjacent to OU4 and directly across from the railroad tracks near OU1.

7.0 TECHNICAL ASSESSMENT

This section provides a technical assessment of the source control remedy in place at OU1 at the Raymark Site. The source control remedy was determined by EPA to be complete in 1997. This five-year review follows the Comprehensive Five-Year Review Guidance (EPA 2001) and was developed to answer the questions shown below.

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Yes. A review of site-related documents, monitoring data, ARARs, risk assumptions, and the results of the numerous site inspections performed at OU1 indicates that the components of the 1995 remedy are functioning as intended by the ROD. This judgment is based on the evaluation of current OU1 conditions determined from the site inspections and interviews of pertinent stakeholders.

Performance Standards Met? The decontamination, demolition, construction of the impermeable cap, and institutional controls have achieved the remedial action objectives of preventing direct exposure (incidental ingestion and dermal contact) to the contaminated soil-waste materials; minimizing leaching of contaminants to groundwater from on-site source areas; and preventing human exposure to contaminants in the buildings, process equipment, and subsurface drains.

On-site buildings were demolished and materials were disposed of on-site when possible. Metal materials were decontaminated and recycled when possible. Asbestos materials from the buildings were disposed of under the OU1 cap. Waste was consolidated and back-filled below the cap. Existing subsurface drains were plugged to prevent continuing discharges to Ferry Creek. Storm drainage piping was installed in trenches above the impermeable liner layer to control storm water discharges. There are four sumps located in low areas of the cap where

infiltrated storm water is collected and pumped into the storm water system for discharge off the OU1 property.

Operation and Maintenance Occurring? The O&M of the cap has, on the whole, been effective. The multi-layer, impermeable cap effectively prevents human contact with contaminated soil/waste and prevents infiltration of rain water that could cause contaminants to leach into the groundwater. The property is well-maintained, with no evidence of erosion, surface cracks, or digging below allowable levels. There is a fence around most of the perimeter of the property to prevent random foot traffic. Site access is primarily through the two entrances/exits to the shopping center. The property has an ELUR that appears to be followed. This is essential to ensure the protectiveness of the cap and not damage the cap's integrity. The CTDEP and its contractor, as well as the property management and its contractor, all conduct inspections of the property on a regular basis (weekly, monthly, and quarterly). In addition to the cap, the following components are operational on the OU1 property:

- On-site gases released from the waste below the impermeable liner layer that could accumulate and permeate upward through or otherwise disturb the cap are collected and conveyed to the treatment buildings. The collection system appears to function effectively with no major problems. Concentrations of gases conveyed to the treatment buildings are below State of CT MASC limits and so are discharged directly to the atmosphere. Monitoring of negative pressures in the soil gas collection (SGC) system indicate that the system is effectively preventing potential vapor intrusion into buildings constructed over the cap.

- The NAPL collection system is operational and functioning as intended, but is only collecting minimal amounts of NAPL. Four of the five wells have not produced NAPL since their installation in 1997. The amount of NAPL recovered from the remaining well has been very low. Well redevelopment is anticipated to optimize NAPL recovery in the wells. The NAPL recovery system will be reassessed as part of the OU2 Feasibility Study/Record of Decision.

- The groundwater monitoring system appears to be operating effectively. Samples have been collected and analyzed according to a schedule approved by CTDEP and EPA. Most of the trends in contaminant levels are fluctuating, flat, or levels are low, but some

VOCs of concern remain high at some well locations. To date, the CTDEP has generated 15 years of groundwater data in the process of evaluating the effectiveness of the cap and has determined that the monitoring frequency can be reduced without compromising the cap's effectiveness. Because of this, the CTDEP is planning to further reduce sample frequency in order to reduce operating costs. EPA has concurred with CTDEP changes.

The revised plan is to change from semi-annual sampling of 12 wells for VOCs to sampling every 9 months. This approach would have the advantage of periodically sampling during each season, but it would reduce the data available to track trends for a given season. The frequency of sampling all wells for VOC analysis would also be reduced from annually to every 5 years. As a note, groundwater is not part of this source control OU. While the groundwater is monitored at OU1, the information is included in the overall groundwater OU (OU2). The changes to sampling frequency are documented as amendments to the O&M Manual. Section 12.0 of the O&M Manual indicates the process to be followed.

7.2 Question B: Are the Exposure Assumption, Toxicity Data, Clean-up Levels, and Remedial Action Objectives Used at the Time of the Remedy Selection Still Valid?

No. Some of the exposure assumptions, toxicity data, and clean-up levels used at the time of the remedy selection in 1995 have changed and are not still valid; however, because the source control remedy relied on preventing direct contact with soil with the placement of an impermeable cap over the source area that prevents direct contact with contamination, infiltration of rainwater, and vapor intrusion into on-site buildings, the remedy remains protective of human health and the environment. The RAOs used at the time of the remedy selection are still valid.

Changes in Applicable, Relevant, and Appropriate Regulations Standards and To Be Considered (TBCs)

As part of this third five-year review, the ARARs and To Be Considered (TBCs) for OU1 were reviewed for changes that might affect the protectiveness of the remedy. Appendix D presents the tables summarizing the ARARs and TBCs that were presented in ROD. Table 4-2A in the

ROD contained the chemical-specific TBCs (non chemical-specific ARARs were identified). Table 4-2B in the ROD contained the action-specific ARARs and TBCs for the selected remedy. In addition, the ROD identified one location-specific ARAR, the Connecticut Coastal Management Act (Title 22a, Chapter 440, Sections 90-122). As part of this third five-year review, the ARARs for OU1 that were presented in the ROD were reviewed, and a review of current ARARs was conducted. Because the construction of the components of the source control remedy has been completed, the location and action-specific ARARs pertaining to construction activities that were cited in the ROD have been met and remain unchanged.

Other requirements apply to the on-going operation and maintenance of the OU1 remedy, including the cap and the SGC and NAPL removal systems. There have been no changes to the ARARs and TBCs and no new standards that affect the protectiveness of the remedy. The tables include a brief synopsis of the requirements and the actions to be taken under the remedy to meet the requirements. The ROD indicated that the selected remedy met the requirements of the ARARs.

One of the TBCs in 1995 was the proposed Regulations of Connecticut State Agencies, Remediation Standard, Sections 22a-133k-1 through 22a-133k-3. These proposed Connecticut Remediation Standards Regulations (RSRs) included soil direct exposure standards and were considered in the selection of the remedy. Although the RSRs were not yet promulgated, the remedy met the proposed requirement by preventing direct exposure through the installation of the cap. The regulations took effect without change in July 1996. The regulations were subsequently updated several times to approve criteria for additional polluting substances, and to add or amend criteria. The RSR changes do not affect the protectiveness of the source control remedy because the cap continues to prevent direct exposure to soils and the SGC system prevents vapor intrusion at on-site buildings. For this five-year review, there are no regulatory changes that affect the protectiveness of the cap and SGC system; therefore, the source control remedy continues to be protective of human health and the environment.

Changes in Land Use of the Site and Physical Site Conditions

At the time of the ROD signing, the OU1 property was an abandoned manufacturing plant. Based on the ROD and the subsequent execution of the remedial action, OU1 is considered a successful Brownfields project as it was transformed from an abandoned parcel to an operating

shopping center. The placement of the cap and installation of the SGC and NAPL systems were done in concert with this transformation and as such accounted for the change in use by pre-loading soils, installing the vapor capture system, installing building pods, and laying out the perimeter fencing and plantings. Today the cap remains in place essentially as it was installed 15 years ago and the SGC systems continues to operate as intended. The NAPL collection system is operational, but NAPL recovery is low, as evidenced by the reduction in quantity of NAPL recovery over time at RW-3. Recovery well redevelopment is proposed to optimize NAPL recovery. Additionally, further study and remediation of the groundwater from the Raymark site, including the NAPL recovery system, will be evaluated in the Raymark OU2-Groundwater FS.

Changes in Exposure Pathways, Toxicity, Risk Assessment Methods, and Other Contaminant Characteristics

Changes have occurred to toxicity values used for the OU1 human health risk assessment (e.g. TCE), methods used to evaluate vapor intrusion exposures, methods used to evaluate exposures to asbestos, and methods used to evaluate mutagenic carcinogens, including PAHs. However, because the source control remedy relies on a cap and SGC systems to prevent exposures by contaminants by direct contact with soils, groundwater, or inhalation of indoor air, these changes do not impact the protectiveness of the remedy. No ecological targets were identified during the baseline risk assessment and none were identified during this five-year review; therefore, monitoring of ecological targets is not necessary. There is no other information that calls into question the protectiveness of the remedy for OU1.

Expected Progress Towards Meeting RAOs

The remedy is effectively preventing direct human exposures to contaminated soil-waste materials and to contaminants in buildings, process equipment, and subsurface drains. The cap minimizes leaching of contaminants to groundwater from on-site source areas. The NAPL collection system is functioning as intended, but is removing only minimal amounts of NAPL. The recovery wells should be re-evaluated to optimize NAPL recovery beneath the cap. Well redevelopment is anticipated in the near future. Concentrations of contaminants in the groundwater plume off the OU1 property continue to be of potential concern for down-gradient properties.

7.3 Question C: Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?

No. No new information has become available that could impact the protectiveness of the remedy.

7.4 Technical Assessment Summary

Based on the data reviewed, observations from the site inspection, and the interviews conducted, the remedy is generally functioning as intended by the ROD. Construction of the source control remedy components (cap, SGC system, and NAPL collection system) is complete, and it has been confirmed that the remedy is functioning as designed. The NAPL collection system is operational and functioning as intended, however, the system is recovering minimal amounts of NAPL. Four of the five wells have not produced NAPL. The amount of NAPL recovered from the remaining well has been very low. A re-evaluation of NAPL recovery wells should be conducted to optimize NAPL recovery. Despite the low rate of NAPL recovery, the remedy remains protective of human health and the environment. Some of the exposure assumptions, toxicity data, risk assessment methods, and clean-up levels used at the time of the remedy selection in 1995 have changed; however, because the source control remedy relied on preventing direct contact with contamination and vapor intrusion into on-site buildings, the remedy remains protective of human health and the environment. The frequent site inspections by CTDEP, its consultants, the property managers, and its consultants, continually evaluate the effectiveness of the cap, and its attendant systems (on-site gas removal, NAPL removal, and groundwater sampling). The effective implementation of institutional controls has continued to ensure the integrity of the cap by restricting on-site digging. Land use has changed at the OU1 property since the ROD was signed in 1995, but the changes were anticipated in the design of the remedy and have not changed or added any exposure routes.

8.0 ISSUES

The issue identified during this third five-year review primarily relates to the State's O&M activities, specifically the NAPL extraction. The ROD requires that O&M activities be reassessed, at a minimum, with every five-year review. The issue identified below was previously identified during the 2005 five-year review. The issue and its progress are presented in greater detail in

Section 5.0. No new issues have been identified during this five-year review. The issue identified below does not impact the protectiveness of the remedy; it is preventative in nature.

Issues	Affects Protectiveness (Y/N)	
	Current	Future
Issue 1: The NAPL extraction system is removing NAPL, however, only one recovery well (RW-3) is functioning and that well is extracting minimal quantities.	N	N

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

EPA and CTDEP have discussed goals and expectations for OU1 as it has been 15 years since the ROD was written, 13 years since the O&M Manual was written, and the OU1 property has been redeveloped in the past 8 years. Because of time and Site changes, the expectations associated with a number of the on-site systems have changed. The only outstanding issue identified in this third five-year review in particular, however, is the NAPL system. When EPA begins work on the ground water cleanup (OU2), that the effort will encompass both on-property ground water contamination, including the NAPL recovery system, and the plume emanating from off-site.

The recommendation for OU1 is as follows:

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Data	Follow-up Actions: Affects Protectiveness (Y/N)	
					Current	Future
The NAPL extraction system is removing NAPL, however, only one recovery well (RW-3) is functioning and that well is extracting minimal quantities.	Optimize the NAPL recovery system by redeveloping recovery well 3 (RW-3), and perform re-evaluation of entire NAPL recovery system during the OU2-Groundwater Feasibility Study to determine whether the system should be modified to increase its effectiveness.	EPA/State	EPA/State	9/1/2012	N	N

10.0 PROTECTIVENESS STATEMENTS

The remedy at OU1 is protective of human health and the environment. Exposure pathways that could result in unacceptable risks are being controlled.

11.0 NEXT REVIEW

The fourth five-year review for Raymark OU1 is scheduled to be conducted in 2015. This review will be required as hazardous wastes remain at OU1 above levels for unlimited use and unrestricted exposure.

TABLES

Table 6-1
Groundwater Monitoring Data - Analytical Results for Selected VOCs
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			VOC	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	1	B	Chlorobenzene	ND	1.2	ND
PC	1	D	Chlorobenzene	8	10.2	5.5
PC	1	M	Chlorobenzene	35	698	1300
PC	1	S	Chlorobenzene	ND	2.4	ND
PC	2	B	Chlorobenzene	13	24.9	ND
PC	2	D	Chlorobenzene	ND	28.6	9.9
PC	2	M	Chlorobenzene	22	54.3	420
PC	2	S	Chlorobenzene	0.6	2.2	3.8
PC	2	B	1,1 Dichlorethene (DCE)	55300	32200	35000
PC	2	D	1,1 Dichlorethene (DCE)	24800	17700	22000
PC	2	M	1,1 Dichlorethene (DCE)	826	811	200
PC	2	S	1,1 Dichlorethene (DCE)	2	105	ND
PC	2	B	1,1,1-Trichloroethane	190000	91200	98000
PC	2	D	1,1,1-Trichloroethane	178000	264000	190000
PC	2	M	1,1,1-Trichloroethane	1700	2450	1800
PC	2	S	1,1,1-Trichloroethane	17	1370	ND
PC	3	B	Chlorobenzene	15.6	58.3	1200
PC	3	D	Chlorobenzene	240	6400	4500
PC	3	S	Chlorobenzene	7400	7740	5200
PC	4	B	Chlorobenzene	16.9	160	42
PC	4	D	Chlorobenzene	1140	2540	2500
PC	4	S	Chlorobenzene	1270	350	340
PC	4	B	Toluene	ND	ND	ND
PC	4	D	Toluene	ND	30.4	ND
PC	4	S	Toluene	17000	135000	3200
PC	5	B	Trichloroethene	770	311	120
PC	5	D	Trichloroethene	130	3.9	85
PC	5	M	Trichloroethene	ND	ND	ND
PC	5	S	Trichloroethene	ND	ND	ND
PC	6	B	1,1 Dichlorethene (DCE)	34	53.9	210
PC	6	D	1,1 Dichlorethene (DCE)	ND	3.3	ND
PC	6	M	1,1 Dichlorethene (DCE)	ND	ND	ND
PC	6	S	1,1 Dichlorethene (DCE)	ND	ND	ND
PC	6	B	Trichloroethene	535	266	960
PC	6	D	Trichloroethene	1	1.3	ND
PC	6	M	Trichloroethene	2	ND	ND
PC	6	S	Trichloroethene	ND	ND	7.4
PC	7	S	Chlorobenzene	20400	12000	2700
PC	8	B	1,1 Dichlorethene (DCE)	798	51.9	640
PC	8	D	1,1 Dichlorethene (DCE)	20	13.2	16
PC	8	S	1,1 Dichlorethene (DCE)	11	9.7	5.2
PC	8	B	1,1,1-Trichloroethane	1340	45.9	280
PC	8	D	1,1,1-Trichloroethane	380	194	130
PC	8	S	1,1,1-Trichloroethane	710	200	77
PC	8	B	Trichloroethene	1910	111	1400
PC	8	D	Trichloroethene	22	60.2	70

Table 6-1
Groundwater Monitoring Data - Analytical Results for Selected VOCs
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			VOC	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	8	S	Trichloroethene	4	4.7	2.7
PC	9	D	1,1 Dichlorethene (DCE)	300	210	180
PC	9	S	1,1 Dichlorethene (DCE)	93	620	45
PC	9	D	1,1,1-Trichloroethane	3000	2060	2200
PC	9	S	1,1,1-Trichloroethane	1820	16900	650
PC	9	D	Trichloroethene	1400	624	1500
PC	9	S	Trichloroethene	82	420	9.1
PC	9	D	Vinyl Chloride	92	1130	150
PC	9	S	Vinyl Chloride	100	1110	310
PC	10	B	Trichloroethene	790	1420	2000
PC	10	D	Trichloroethene	824	1340	1000
PC	10	M	Trichloroethene	402	348	220
PC	10	S	Trichloroethene	89.2	96.3	1300
PC	11	B	Trichloroethene	1500	36.5	12
PC	11	D	Trichloroethene	1400	576	180
PC	11	M	Trichloroethene	300	98.3	20
PC	11	S	Trichloroethene	2.2	8.2	ND
PC	12	B	Trichloroethene	3480	2980	2400
PC	12	D	Trichloroethene	5800	8560	5700
PC	12	S	Trichloroethene	ND	4100	ND
PC	12	B	Vinyl Chloride	97	14.2	11
PC	12	D	Vinyl Chloride	360	174	40
PC	12	S	Vinyl Chloride	60	425	270
PC	13	B	Chlorobenzene	89.6	165	130
PC	13	D	Chlorobenzene	5.2	4.2	2.2
PC	13	M	Chlorobenzene	1	14.2	ND
PC	13	S	Chlorobenzene	ND	2.4	1
PC	13	B	Trichloroethene	5960	6500	6300
PC	13	D	Trichloroethene	840	775	460
PC	13	M	Trichloroethene	38.3	45.8	41
PC	13	S	Trichloroethene	300	125	60
PC	14	B	Chlorobenzene	70	213	8.3
PC	14	D	Chlorobenzene	160	252	140
PC	14	S	Chlorobenzene	1020	966	950
PC	14	B	Trichloroethene	6800	8080	350
PC	14	D	Trichloroethene	7700	9620	8300
PC	14	S	Trichloroethene	120	60.8	33
PC	14	B	Toluene	166	597	ND
PC	14	D	Toluene	350	609	350
PC	14	S	Toluene	38	79	11
PC	14	B	1,1,1-Trichloroethane	ND	148	ND
PC	14	D	1,1,1-Trichloroethane	ND	110	110
PC	14	S	1,1,1-Trichloroethane	ND	ND	ND
PC	15	B	Chlorobenzene	320	357	220
PC	15	D	Chlorobenzene	190	451	55
PC	15	S	Chlorobenzene	280	96	2.8

Table 6-1
Groundwater Monitoring Data - Analytical Results for Selected VOCs
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			VOC	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	15	B	Trichloroethene	1300	1120	1400
PC	15	D	Trichloroethene	4	50.6	7.5
PC	15	S	Trichloroethene	ND	8.3	5.1
PC	16	B	1,1 Dichlorethene (DCE)	4560	2720	1300
PC	16	D	1,1 Dichlorethene (DCE)	94	209	240
PC	16	M	1,1 Dichlorethene (DCE)	71	168	130
PC	16	S	1,1 Dichlorethene (DCE)	ND	ND	ND
PC	16	B	1,1,1-Trichloroethane	12000	4880	1800
PC	16	D	1,1,1-Trichloroethane	410	411	250
PC	16	M	1,1,1-Trichloroethane	270	399	200
PC	16	S	1,1,1-Trichloroethane	4	3	ND
PC	16	B	Trichloroethene	560	340	190
PC	16	D	Trichloroethene	2400	1720	720
PC	16	M	Trichloroethene	61.9	57.8	36
PC	16	S	Trichloroethene	6	2	1.6

Notes:
VOCs - Volatile Organic Compounds
ug/L - micrograms per liter

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	1	B	Arsenic	NA	60	83
PC	1	D	Arsenic	NA	NA	30
PC	1	M	Arsenic	NA	ND	NA
PC	1	S	Arsenic	NA	ND	74
PC	1	B	Cadmium	NA	5	10
PC	1	D	Cadmium	NA	NA	11
PC	1	M	Cadmium	NA	NA	1
PC	1	S	Cadmium	NA	ND	ND
PC	1	B	Chromium	NA	73	928
PC	1	D	Chromium	NA	NA	ND
PC	1	M	Chromium	NA	2	3
PC	1	S	Chromium	NA	ND	ND
PC	1	B	Lead	NA	20	2750
PC	1	D	Lead	NA	NA	913
PC	1	M	Lead	NA	ND	ND
PC	1	S	Lead	NA	ND	1
PC	1	B	Selenium	NA	ND	4560
PC	1	D	Selenium	NA	NA	1540
PC	1	M	Selenium	NA	ND	ND
PC	1	S	Selenium	NA	ND	4
PC	2	B	Arsenic	NA	70	154
PC	2	D	Arsenic	NA	70	112
PC	2	M	Arsenic	NA	40	28
PC	2	S	Arsenic	NA	300	279
PC	2	B	Cadmium	NA	11.2	30
PC	2	D	Cadmium	NA	13.9	39
PC	2	M	Cadmium	NA	11.8	13
PC	2	S	Cadmium	NA	ND	ND
PC	2	B	Chromium	NA	2	2020
PC	2	D	Chromium	NA	3	900
PC	2	M	Chromium	NA	134	278
PC	2	S	Chromium	NA	ND	ND
PC	2	B	Lead	NA	30	67
PC	2	D	Lead	NA	30	130
PC	2	M	Lead	NA	ND	16
PC	2	S	Lead	NA	ND	6
PC	2	B	Selenium	NA	ND	ND
PC	2	D	Selenium	NA	ND	ND
PC	2	M	Selenium	NA	ND	ND
PC	2	S	Selenium	NA	ND	ND
PC	3	B	Arsenic	ND	ND	ND
PC	3	D	Arsenic	32800	30	157
PC	3	S	Arsenic	76200	40	18
PC	3	B	Cadmium	NA	0.4	ND
PC	3	D	Cadmium	NA	0.5	ND
PC	3	S	Cadmium	NA	0.5	ND
PC	3	B	Chromium	NA	ND	ND
PC	3	D	Chromium	NA	ND	2

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	3	S	Chromium	NA	7	ND
PC	3	B	Lead	NA	ND	ND
PC	3	D	Lead	NA	ND	2
PC	3	S	Lead	NA	ND	ND
PC	3	B	Selenium	NA	30	ND
PC	3	D	Selenium	NA	ND	ND
PC	3	S	Selenium	NA	ND	ND
PC	4	B	Arsenic	NA	ND	5
PC	4	D	Arsenic	NA	60	59
PC	4	S	Arsenic	NA	ND	ND
PC	4	B	Cadmium	NA	ND	ND
PC	4	D	Cadmium	NA	0.5	ND
PC	4	S	Cadmium	NA	ND	ND
PC	4	B	Chromium	NA	ND	6
PC	4	D	Chromium	NA	ND	1
PC	4	S	Chromium	NA	ND	ND
PC	4	B	Lead	NA	ND	2
PC	4	D	Lead	NA	ND	ND
PC	4	S	Lead	NA	ND	ND
PC	4	B	Selenium	NA	ND	ND
PC	4	D	Selenium	NA	ND	ND
PC	4	S	Selenium	NA	ND	ND
PC	5	B	Arsenic	NA	ND	ND
PC	5	D	Arsenic	NA	30	25
PC	5	M	Arsenic	NA	40	41
PC	5	S	Arsenic	NA	30	ND
PC	5	B	Cadmium	NA	0.4	ND
PC	5	D	Cadmium	NA	0.5	ND
PC	5	M	Cadmium	NA	0.6	ND
PC	5	S	Cadmium	NA	0.5	ND
PC	5	B	Chromium	NA	52	136
PC	5	D	Chromium	NA	ND	175
PC	5	M	Chromium	NA	ND	13
PC	5	S	Chromium	NA	ND	ND
PC	5	B	Lead	NA	50	8
PC	5	D	Lead	NA	100	2
PC	5	M	Lead	NA	ND	ND
PC	5	S	Lead	NA	100	3
PC	5	B	Selenium	NA	ND	ND
PC	5	D	Selenium	NA	ND	ND
PC	5	M	Selenium	NA	ND	ND
PC	5	S	Selenium	NA	ND	ND
PC	6	B	Arsenic	NA	ND	4
PC	6	D	Arsenic	ND	ND	ND
PC	6	M	Arsenic	ND	ND	8
PC	6	S	Arsenic	ND	100	23
PC	6	B	Cadmium	NA	0.4	ND
PC	6	D	Cadmium	ND	0.6	ND

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	6	M	Cadmium	ND	ND	ND
PC	6	S	Cadmium	ND	ND	ND
PC	6	B	Chromium	ND	14	12
PC	6	D	Chromium	ND	ND	2
PC	6	M	Chromium	ND	2	ND
PC	6	S	Chromium	197000	ND	2
PC	6	B	Lead	NA	ND	2
PC	6	D	Lead	ND	ND	ND
PC	6	M	Lead	NA	ND	ND
PC	6	S	Lead	19300	200	6
PC	6	B	Selenium	NA	ND	ND
PC	6	D	Selenium	1000	ND	ND
PC	6	M	Selenium	1000	ND	ND
PC	6	S	Selenium	1000	ND	ND
PC	7	S	Arsenic	63500	60	96
PC	7	S	Cadmium	ND	0.6	ND
PC	7	S	Chromium	ND	ND	ND
PC	7	S	Lead	ND	ND	ND
PC	7	S	Selenium	1000	ND	ND
PC	8	B	Arsenic	ND	ND	ND
PC	8	D	Arsenic	31200	ND	29
PC	8	S	Arsenic	20200	ND	18
PC	8	B	Cadmium	ND	ND	ND
PC	8	D	Cadmium	ND	0.2	ND
PC	8	S	Cadmium	ND	ND	ND
PC	8	B	Chromium	26200	9	721
PC	8	D	Chromium	ND	ND	3
PC	8	S	Chromium	16100	ND	1
PC	8	B	Lead	ND	ND	2
PC	8	D	Lead	ND	ND	7
PC	8	S	Lead	45400	ND	36
PC	8	B	Selenium	1100	ND	ND
PC	8	D	Selenium	1000	ND	ND
PC	8	S	Selenium	1900	ND	ND
PC	9	D	Arsenic	9600	40	23
PC	9	S	Arsenic	33500	41100	52
PC	9	D	Cadmium	ND	ND	ND
PC	9	S	Cadmium	ND	ND	ND
PC	9	D	Chromium	ND	7	ND
PC	9	S	Chromium	ND	ND	ND
PC	9	D	Lead	5400	ND	ND
PC	9	S	Lead	ND	5400	ND
PC	9	D	Selenium	1900	ND	ND
PC	9	S	Selenium	1000	1900	ND
PC	10	B	Arsenic	1000	ND	ND
PC	10	D	Arsenic	2800	ND	ND
PC	10	M	Arsenic	ND	ND	ND
PC	10	S	Arsenic	3100	ND	ND

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	10	B	Cadmium	ND	ND	ND
PC	10	D	Cadmium	ND	0.4	ND
PC	10	M	Cadmium	ND	0.7	ND
PC	10	S	Cadmium	30600	17.2	21
PC	10	B	Chromium	ND	ND	3
PC	10	D	Chromium	ND	34	8
PC	10	M	Chromium	15900	3	2
PC	10	S	Chromium	2600	3	2
PC	10	B	Lead	ND	ND	1
PC	10	D	Lead	ND	ND	1
PC	10	M	Lead	ND	ND	1
PC	10	S	Lead	11600	ND	36
PC	10	B	Selenium	1000	ND	ND
PC	10	D	Selenium	1000	ND	ND
PC	10	M	Selenium	1900	ND	ND
PC	10	S	Selenium	1900	ND	ND
PC	11	B	Arsenic	ND	ND	ND
PC	11	D	Arsenic	ND	ND	ND
PC	11	M	Arsenic	ND	ND	7
PC	11	S	Arsenic	32200	30	103
PC	11	B	Cadmium	ND	0.3	ND
PC	11	D	Cadmium	26300	12.2	8
PC	11	M	Cadmium	25400	1.2	1
PC	11	S	Cadmium	ND	ND	ND
PC	11	B	Chromium	35400	4	15
PC	11	D	Chromium	ND	11	40
PC	11	M	Chromium	ND	4	10
PC	11	S	Chromium	ND	ND	28
PC	11	B	Lead	ND	ND	26
PC	11	D	Lead	ND	20	22
PC	11	M	Lead	ND	ND	25
PC	11	S	Lead	11700	ND	64
PC	11	B	Selenium	ND	ND	ND
PC	11	D	Selenium	ND	ND	ND
PC	11	M	Selenium	ND	ND	ND
PC	11	S	Selenium	ND	ND	ND
PC	12	B	Arsenic	ND	ND	ND
PC	12	D	Arsenic	ND	ND	ND
PC	12	S	Arsenic	5400	ND	6
PC	12	B	Cadmium	3200	10.2	9
PC	12	D	Cadmium	11400	9	11
PC	12	S	Cadmium	ND	13	ND
PC	12	B	Chromium	15800	ND	17
PC	12	D	Chromium	ND	2	185
PC	12	S	Chromium	ND	ND	ND
PC	12	B	Lead	ND	ND	3
PC	12	D	Lead	ND	ND	5
PC	12	S	Lead	ND	ND	ND

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	12	B	Selenium	ND	ND	ND
PC	12	D	Selenium	ND	ND	ND
PC	12	S	Selenium	ND	ND	ND
PC	13	B	Arsenic	ND	ND	ND
PC	13	D	Arsenic	ND	ND	ND
PC	13	M	Arsenic	ND	ND	4
PC	13	S	Arsenic	1800	ND	ND
PC	13	B	Cadmium	ND	ND	1
PC	13	D	Cadmium	208000	86.5	93
PC	13	M	Cadmium	ND	0.4	ND
PC	13	S	Cadmium	44700	5.2	23
PC	13	B	Chromium	ND	2	5
PC	13	D	Chromium	ND	4	18
PC	13	M	Chromium	17200	4	9
PC	13	S	Chromium	21700	3	2
PC	13	B	Lead	ND	ND	ND
PC	13	D	Lead	ND	ND	4
PC	13	M	Lead	2600	ND	7
PC	13	S	Lead	ND	ND	2
PC	13	B	Selenium	ND	ND	ND
PC	13	D	Selenium	ND	ND	ND
PC	13	M	Selenium	ND	ND	ND
PC	13	S	Selenium	ND	ND	ND
PC	14	B	Arsenic	ND	30	ND
PC	14	D	Arsenic	ND	ND	12
PC	14	S	Arsenic	55500	40	36
PC	14	B	Cadmium	ND	6.1	ND
PC	14	D	Cadmium	8800	ND	9
PC	14	S	Cadmium	4900	3.2	ND
PC	14	B	Chromium	18600	25	38
PC	14	D	Chromium	50800	6	20
PC	14	S	Chromium	ND	ND	ND
PC	14	B	Lead	ND	ND	ND
PC	14	D	Lead	672000	ND	20
PC	14	S	Lead	ND	ND	20
PC	14	B	Selenium	ND	ND	ND
PC	14	D	Selenium	ND	ND	ND
PC	14	S	Selenium	3900	ND	ND
PC	15	B	Arsenic	NA	ND	ND
PC	15	D	Arsenic	NA	110	100
PC	15	S	Arsenic	NA	30	8
PC	15	B	Cadmium	NA	0.7	ND
PC	15	D	Cadmium	NA	0.4	ND
PC	15	S	Cadmium	NA	0.5	ND
PC	15	B	Chromium	NA	ND	1
PC	15	D	Chromium	NA	ND	ND
PC	15	S	Chromium	NA	ND	ND
PC	15	B	Lead	NA	ND	ND

Table 6-2
Groundwater Monitoring Data - Analytical Results for Selected Metals
Raymark Industries, Inc. Site
Stratford, Connecticut

Well			Metal	Sample Concentration (µg/L) (maximum)		
				Sampling Period		
				1997-1999	2000-2004	2005-2009
PC	15	D	Lead	NA	ND	ND
PC	15	S	Lead	NA	10	10
PC	15	B	Selenium	NA	ND	ND
PC	15	D	Selenium	NA	ND	ND
PC	15	S	Selenium	NA	ND	ND
PC	16	B	Arsenic	NA	ND	ND
PC	16	D	Arsenic	NA	ND	ND
PC	16	M	Arsenic	NA	ND	ND
PC	16	S	Arsenic	NA	ND	ND
PC	16	B	Cadmium	NA	0.4	ND
PC	16	D	Cadmium	NA	0.6	ND
PC	16	M	Cadmium	NA	343	57
PC	16	S	Cadmium	NA	9.4	14
PC	16	B	Chromium	NA	44	336
PC	16	D	Chromium	NA	ND	4
PC	16	M	Chromium	NA	14	2
PC	16	S	Chromium	NA	6	2
PC	16	B	Lead	NA	ND	ND
PC	16	D	Lead	NA	ND	ND
PC	16	M	Lead	NA	ND	ND
PC	16	S	Lead	NA	ND	ND
PC	16	B	Selenium	NA	ND	ND
PC	16	D	Selenium	NA	ND	ND
PC	16	M	Selenium	NA	ND	ND
PC	16	S	Selenium	NA	ND	ND

Notes:
Only compounds detected are included in the table. For complete analyte list see laboratory analytical reports.
Metals - Priority Pollutant 13
mg/L - milligrams per liter
NA - Compound was not analyzed.
ND - Compound was not detected or analyzed.

FIGURES

0 1000 2000 3000 4000 FEET

APPROXIMATE SCALE

N

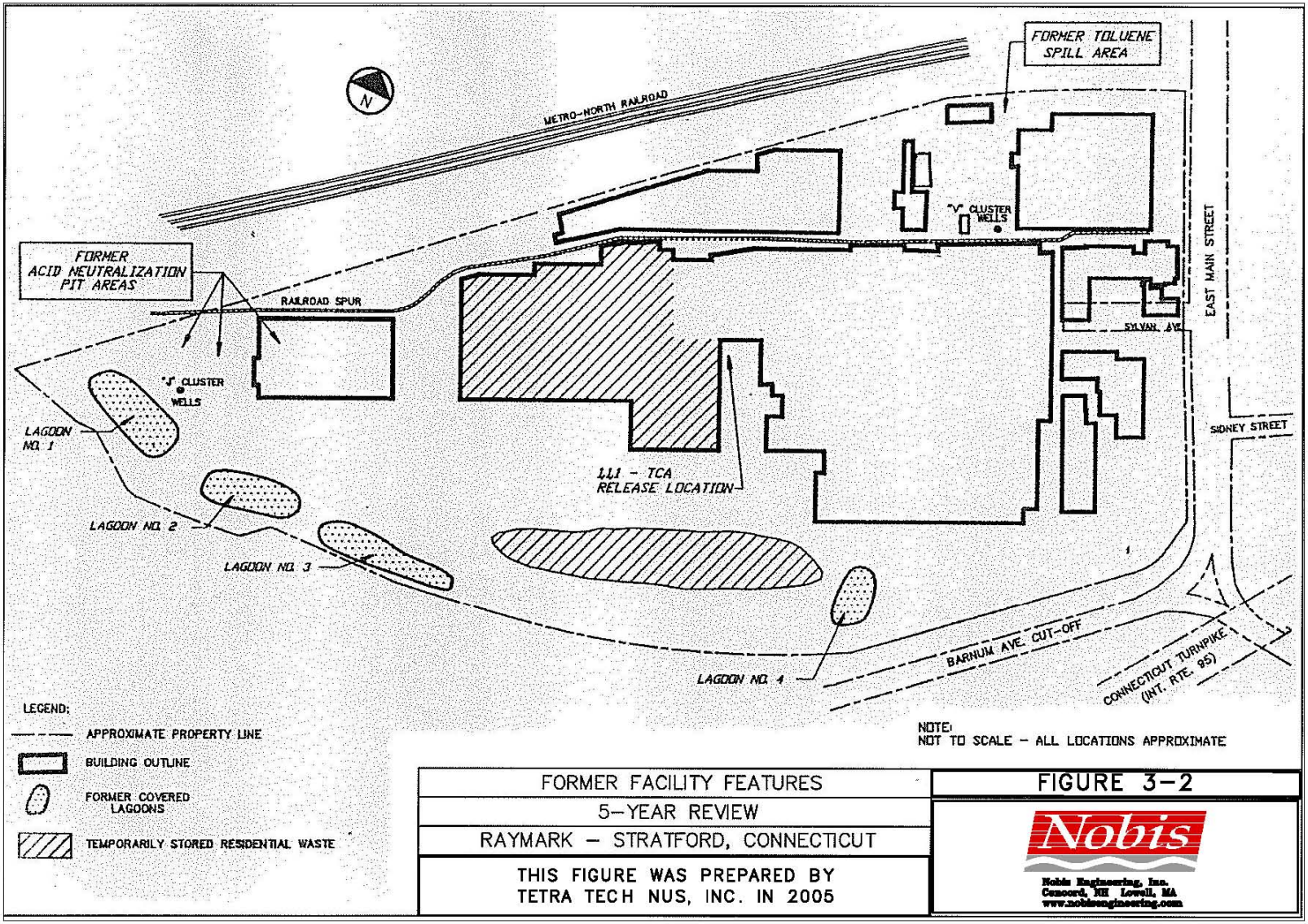
Aerial Photograph Source: Google Earth v5.1.3535.3218

Nobis Engineering, Inc.
18 Chenell Dr.
Concord, NH 03301
Tel (603) 224-4182
Fax (603) 224-2507
www.nobisengineering.com

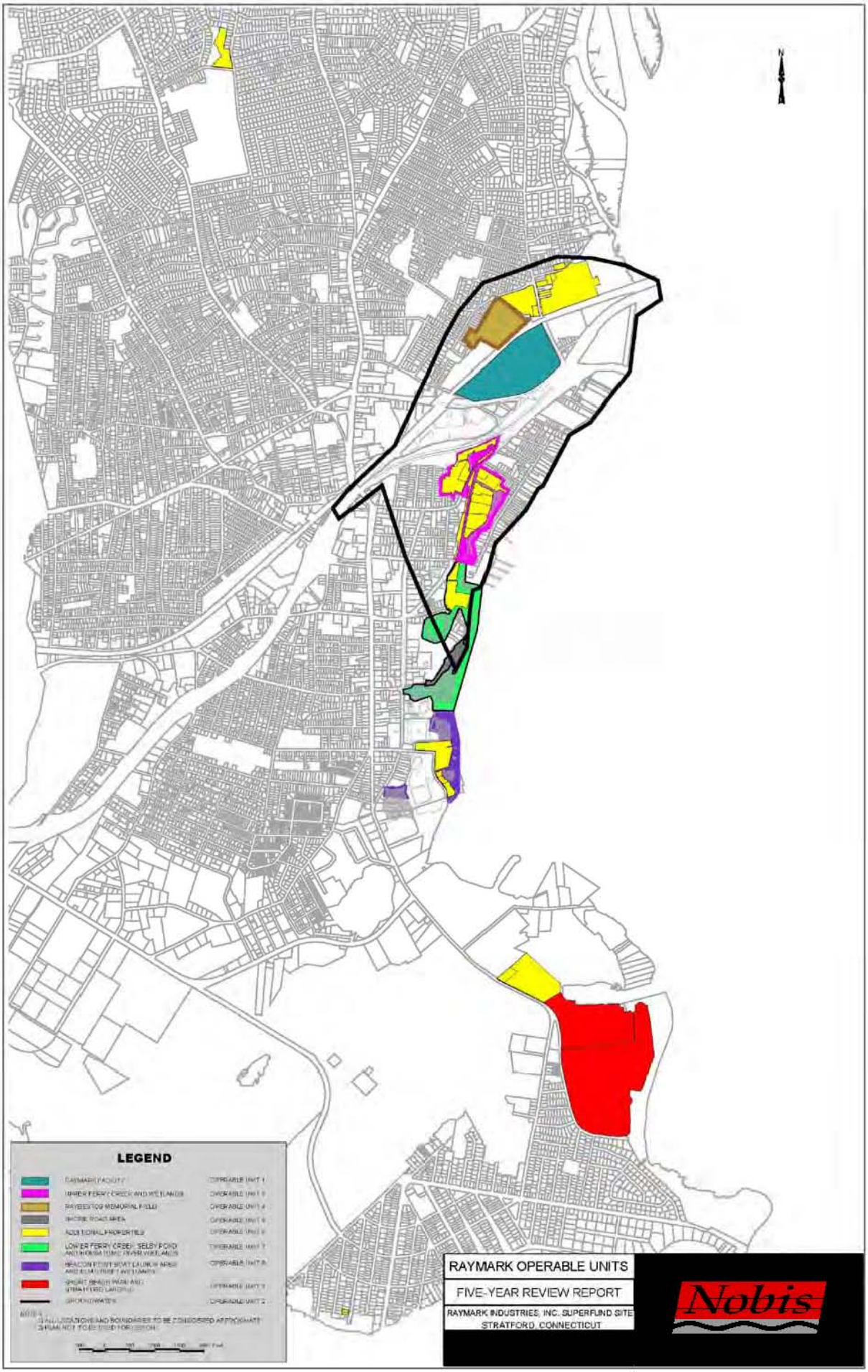
FIGURE 3-1

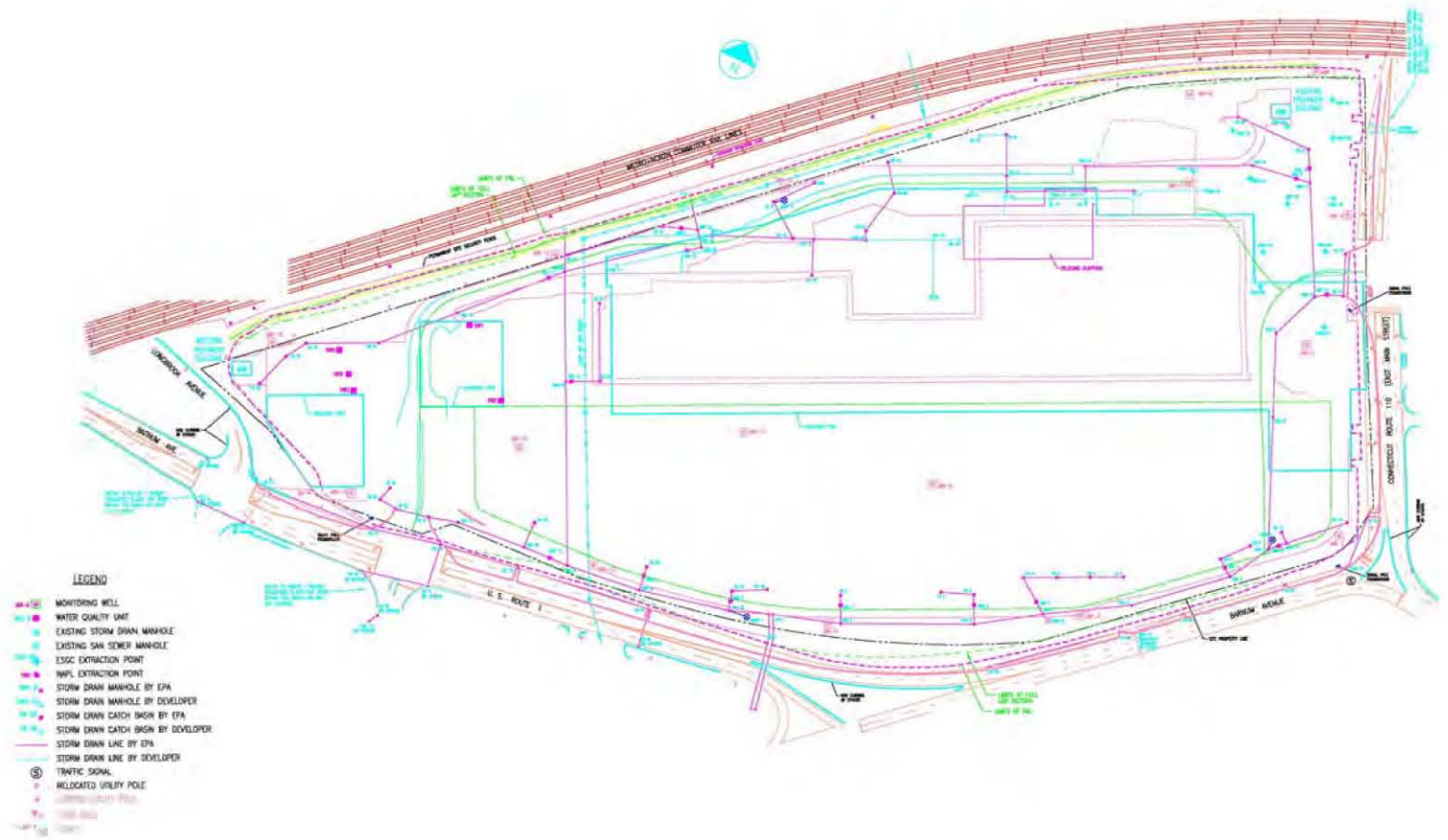
AERIAL PHOTOGRAPH
OU1 FACILITY
RAYMARK
STRATFORD, CONNECTICUT

DRAWN BY:	EJ	
PROJECT:	80054.06	JUNE 30, 2010



FORMER FACILITY FEATURES	FIGURE 3-2
5-YEAR REVIEW	
RAYMARK - STRATFORD, CONNECTICUT	
THIS FIGURE WAS PREPARED BY TETRA TECH NUS, INC. IN 2005	Nobis Engineering, Inc. Concord, NH Lowell, MA www.nobisengineering.com


N
LEGEND
RAYMARK OPERABLE UNITS
FIVE-YEAR REVIEW REPORT
RAYMARK INDUSTRIES, INC. SUPERFUND SITE
STRATFORD, CONNECTICUT
Nobis



NOTES:

PLAN CREATED BY FOSTER WHEELER ENVIRONMENTAL CORP.

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE
BOSTON, MASSACHUSETTS 02210

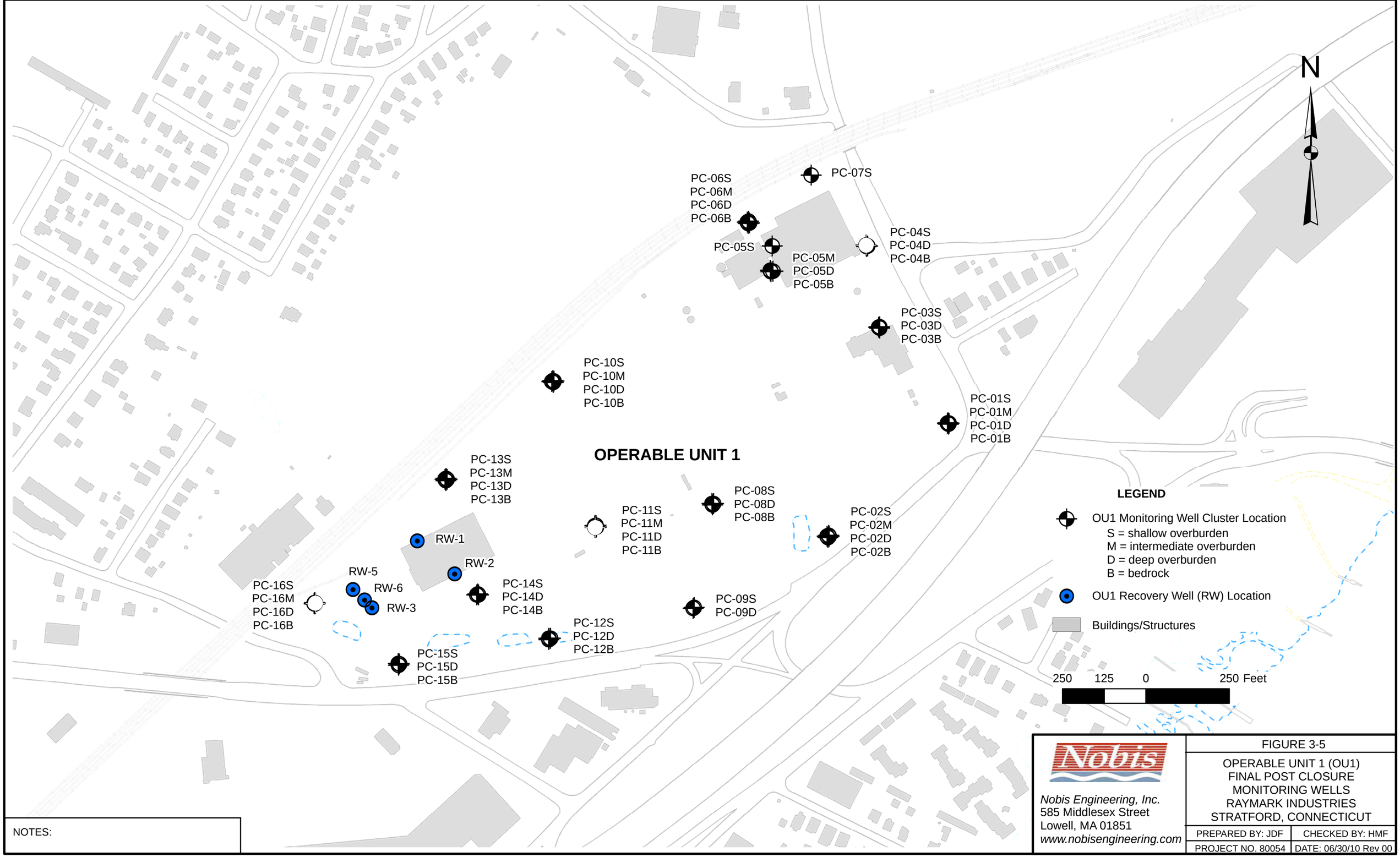
GRAPHIC SCALE
100' 0' 100' 200'

TITLE:
EPA FINAL SITE LAYOUT
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE STRAFORD, CT

FIGURE 3-4

THIS FIGURE WAS CREATED BY
TETRA TECH NUS, INC. 2008

Nobis Engineering, Inc.
Concord, NH Lowell, MA
www.nobisengineering.com



NOTES:

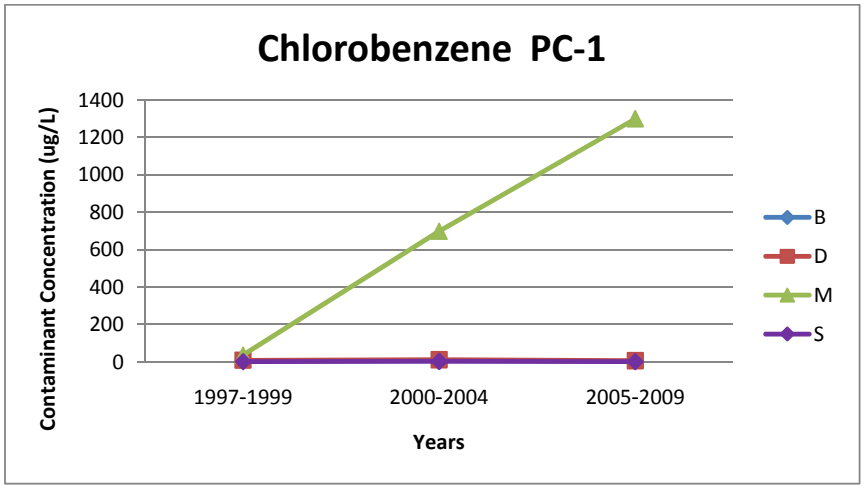
Nobis Engineering, Inc.
585 Middlesex Street
Lowell, MA 01851
www.nobisengineering.com

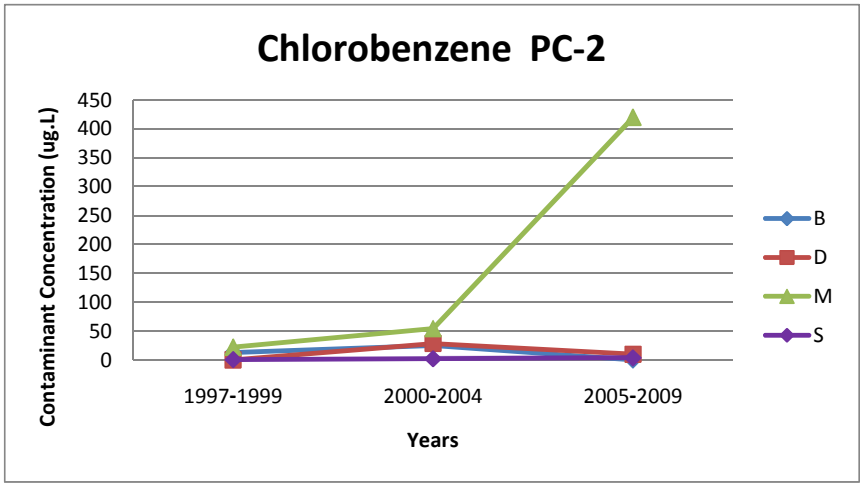
FIGURE 3-5

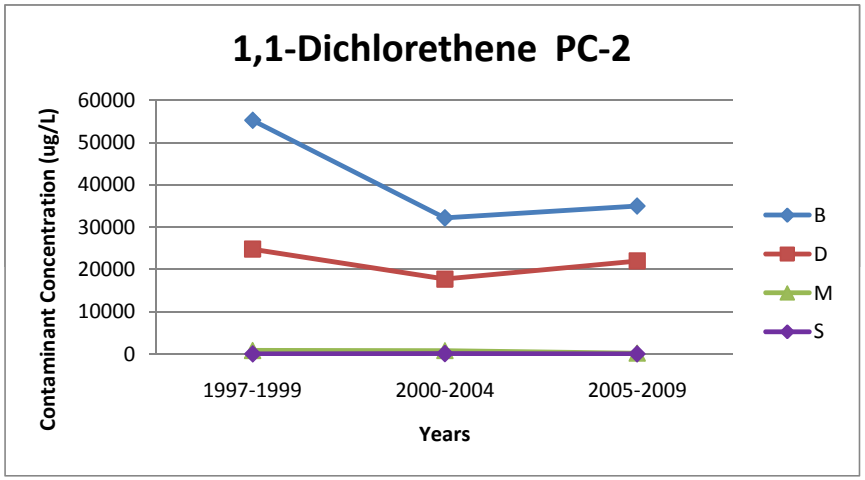
OPERABLE UNIT 1 (OU1)
FINAL POST CLOSURE
MONITORING WELLS
RAYMARK INDUSTRIES
STRATFORD, CONNECTICUT

PREPARED BY: JDF	CHECKED BY: HMF
PROJECT NO. 80054	DATE: 06/30/10 Rev 00

FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 1 OF 9







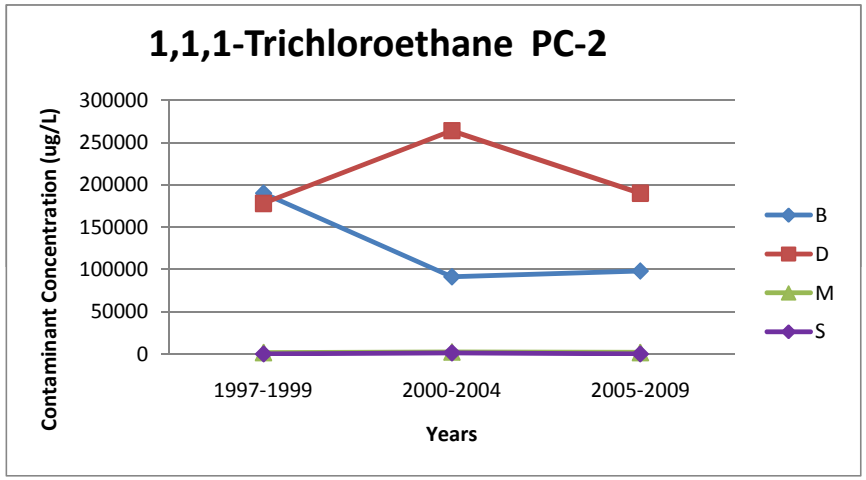
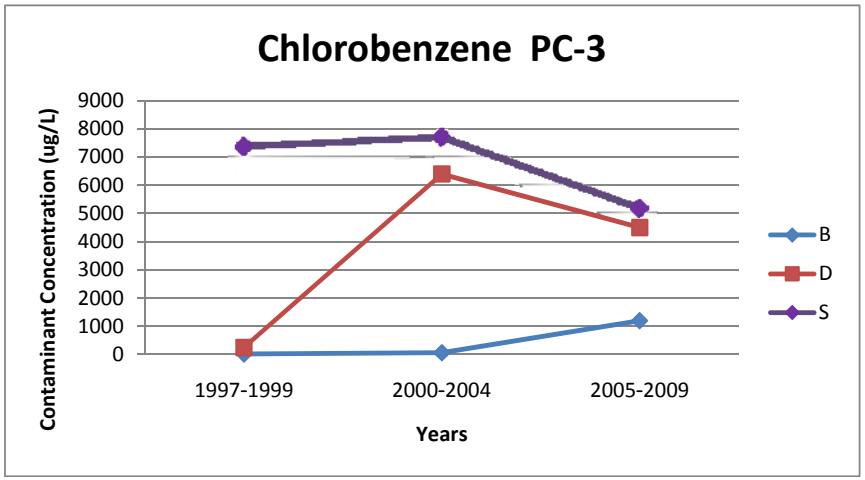
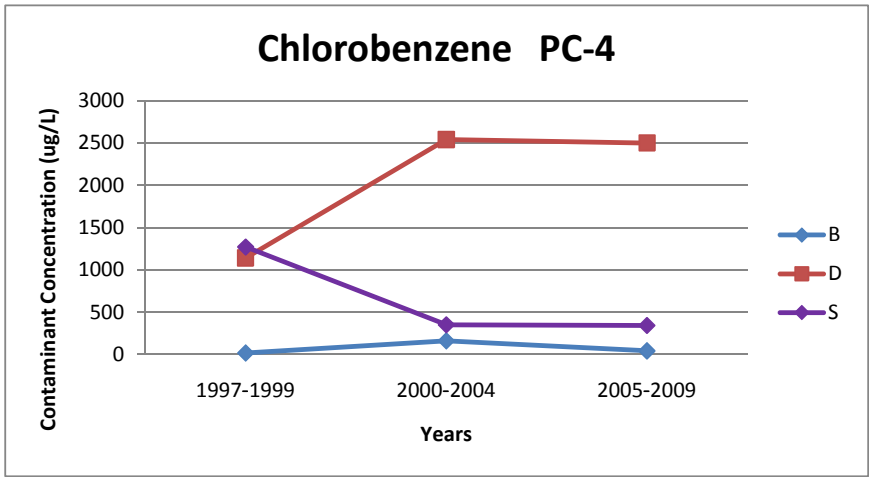
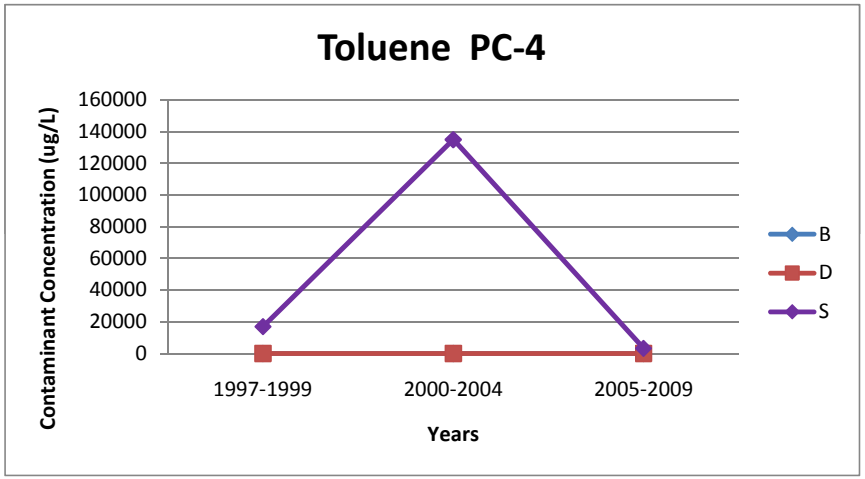


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 2 OF 9







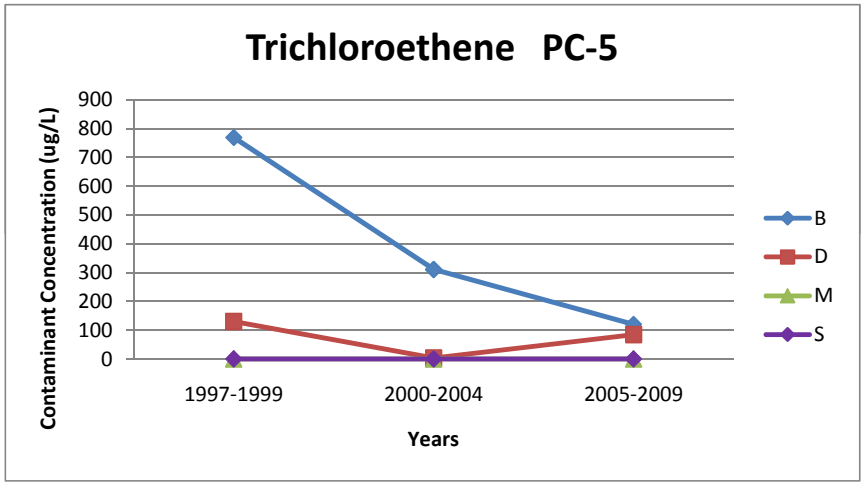
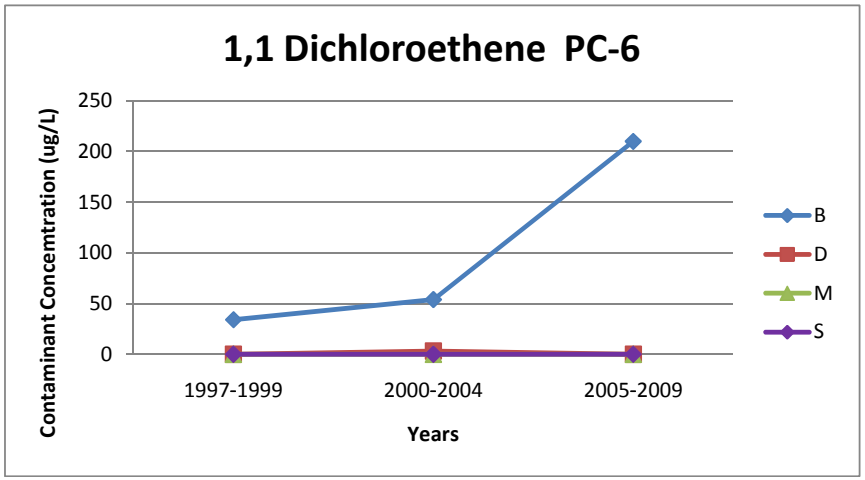
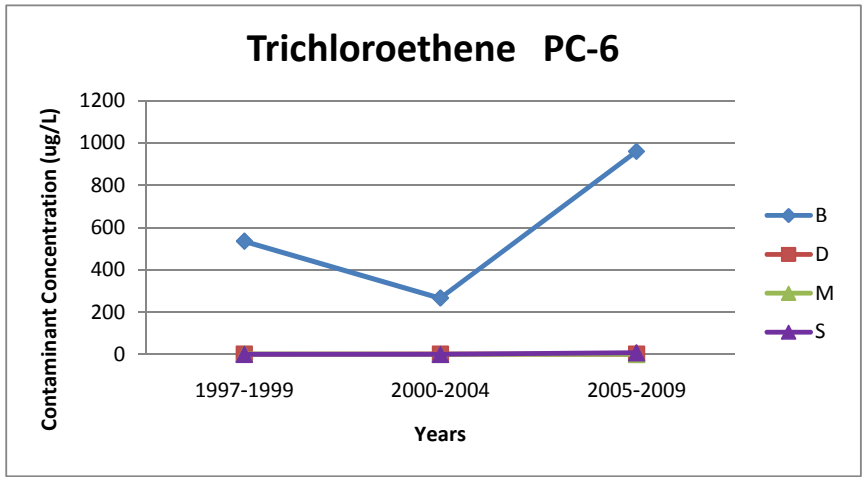
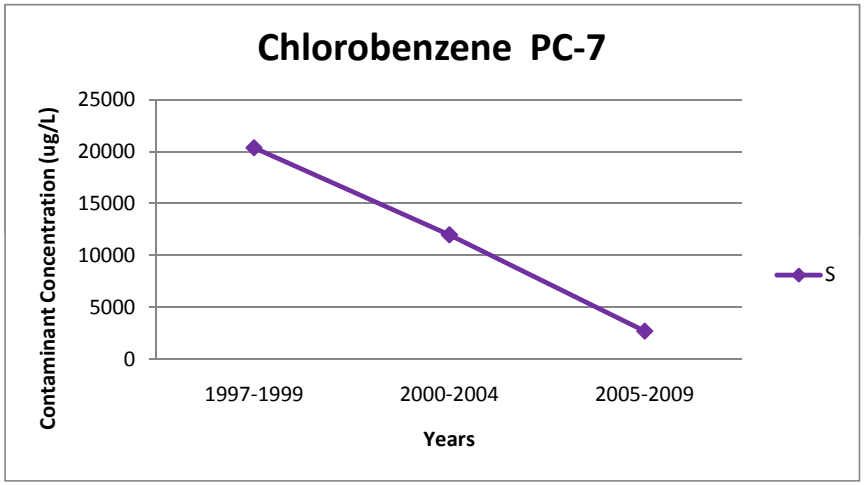


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT







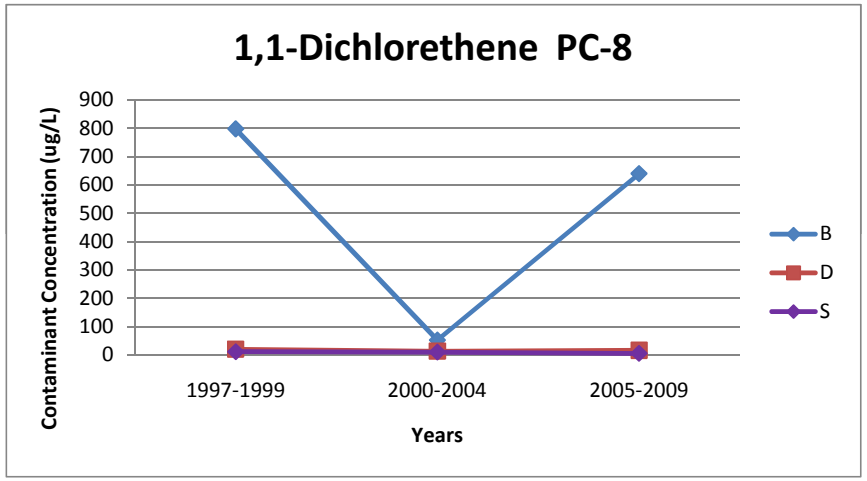
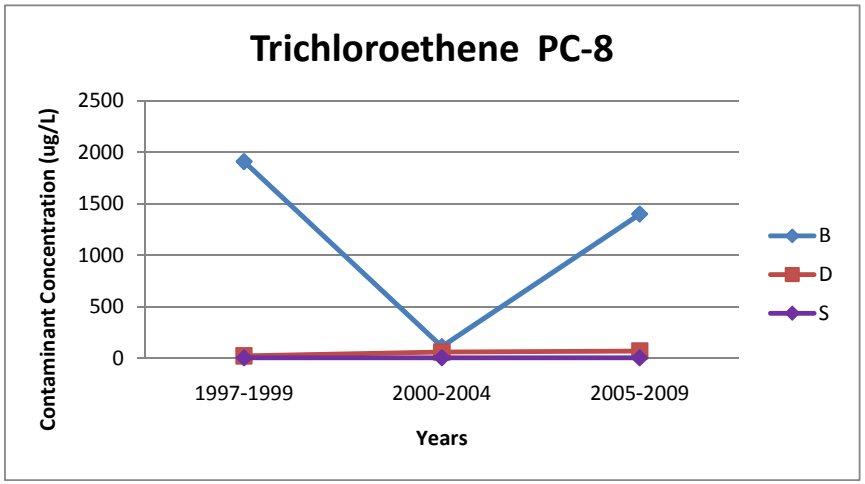
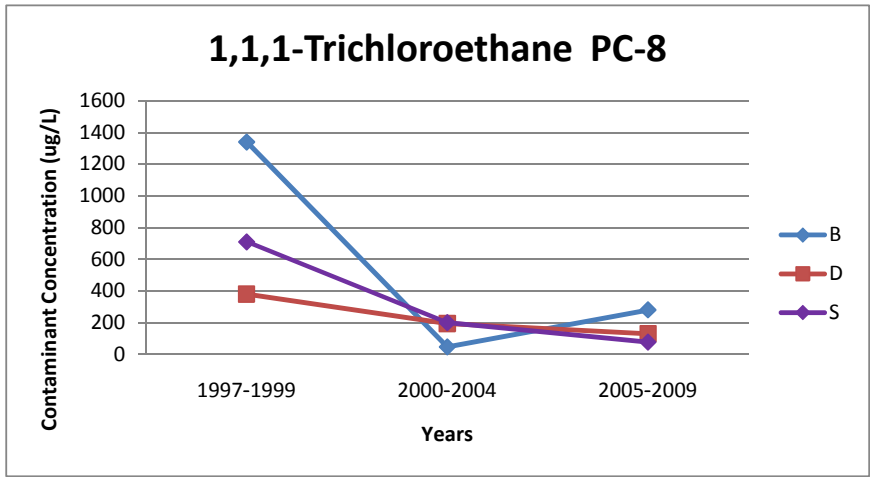
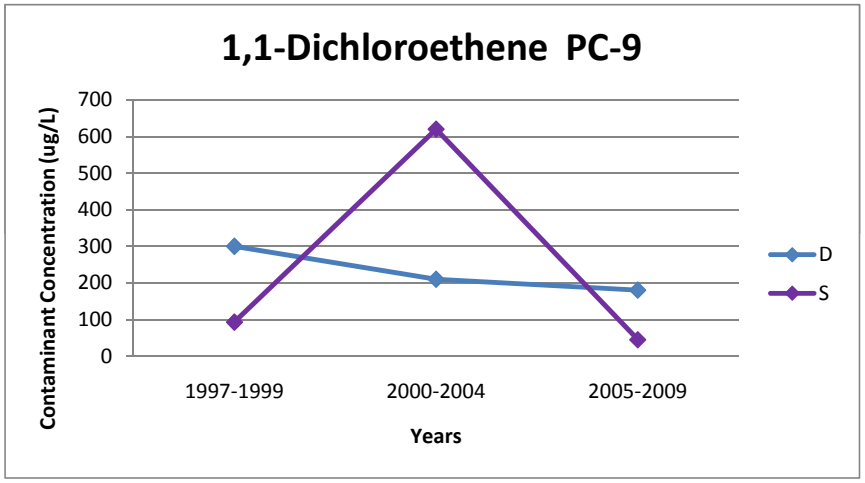


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 4 OF 9







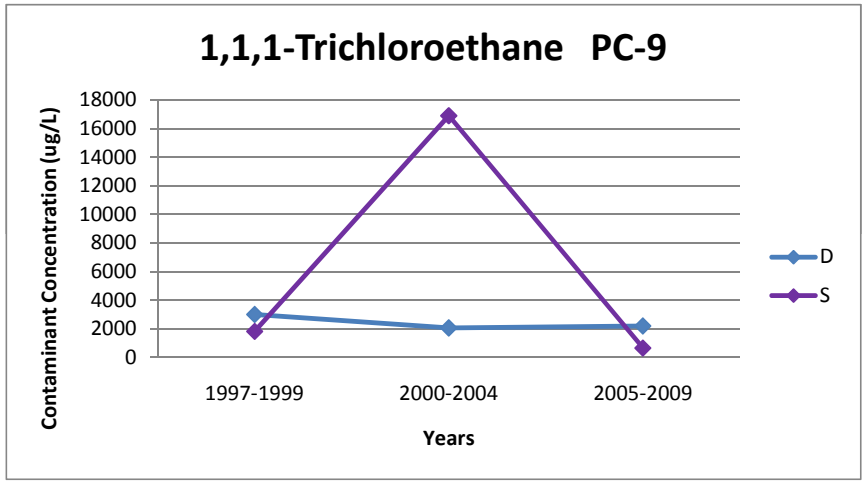
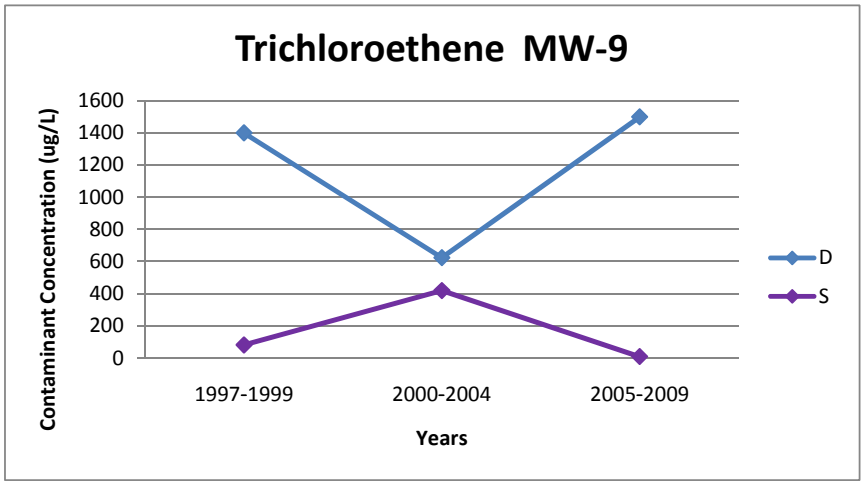
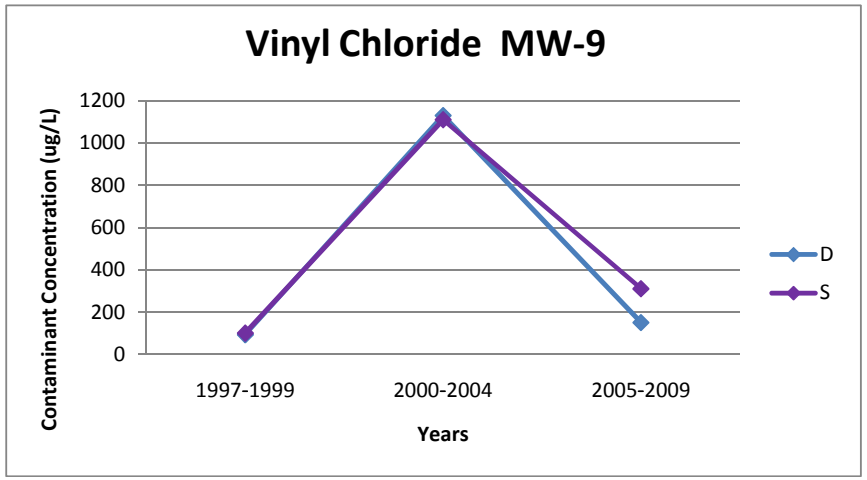
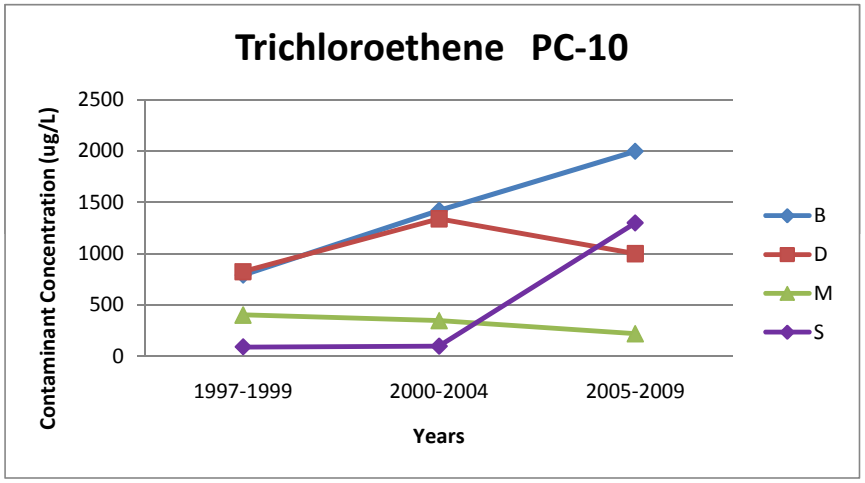


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT







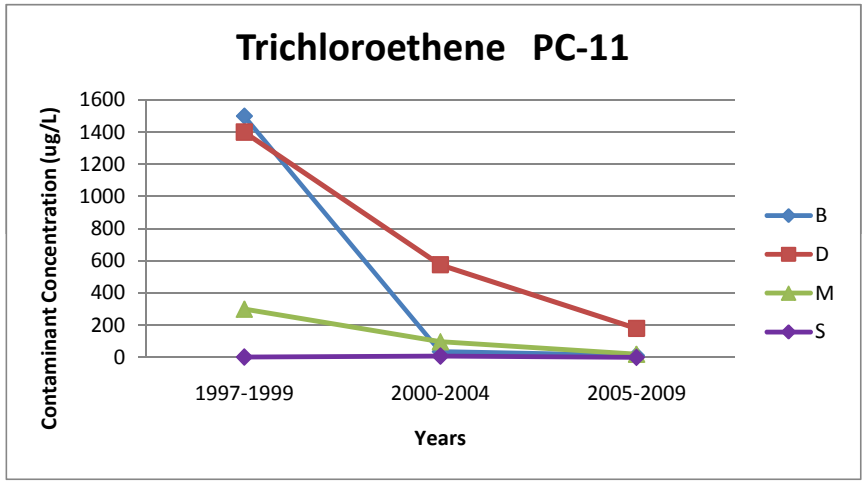
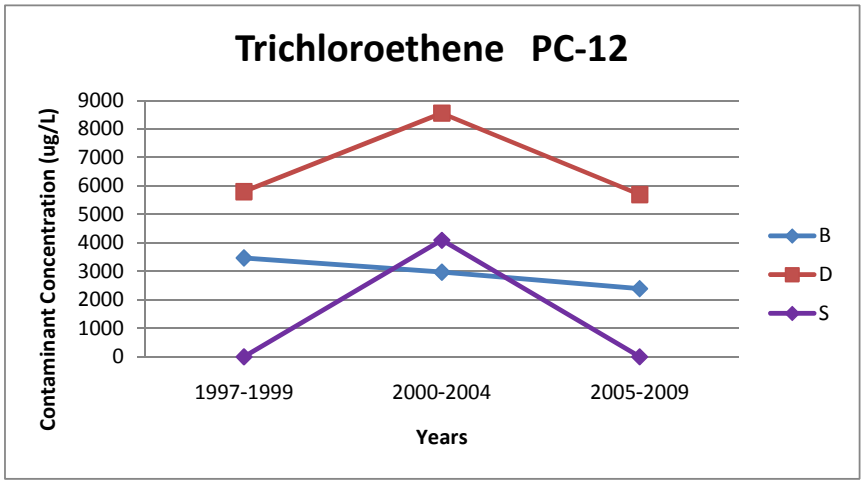
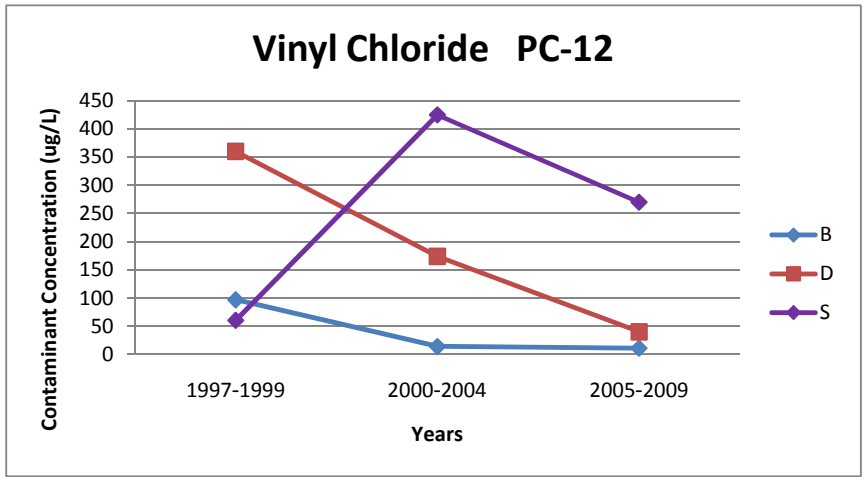
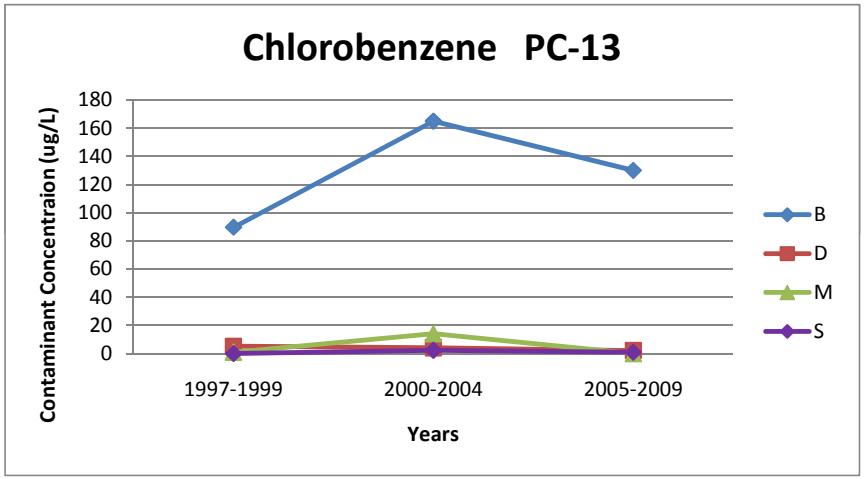


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 6 OF 9







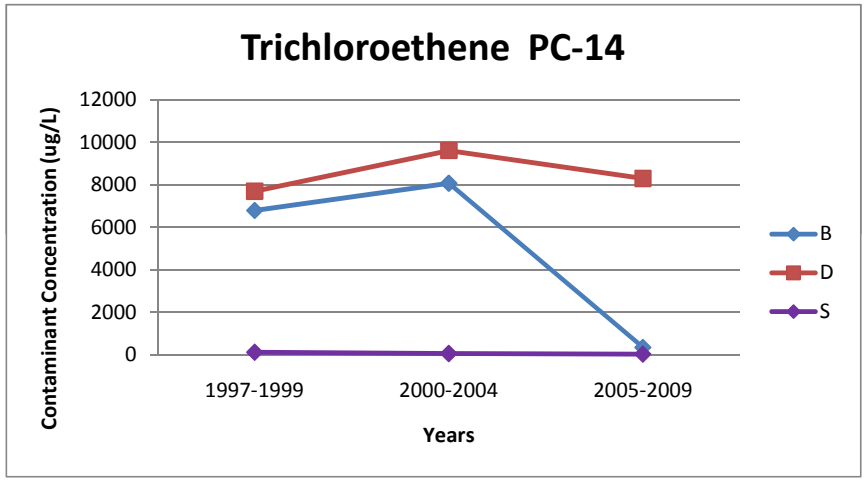
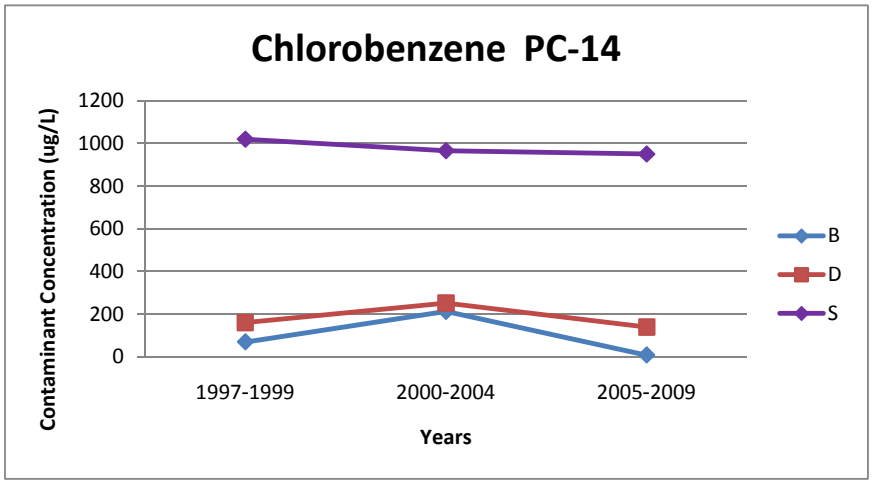
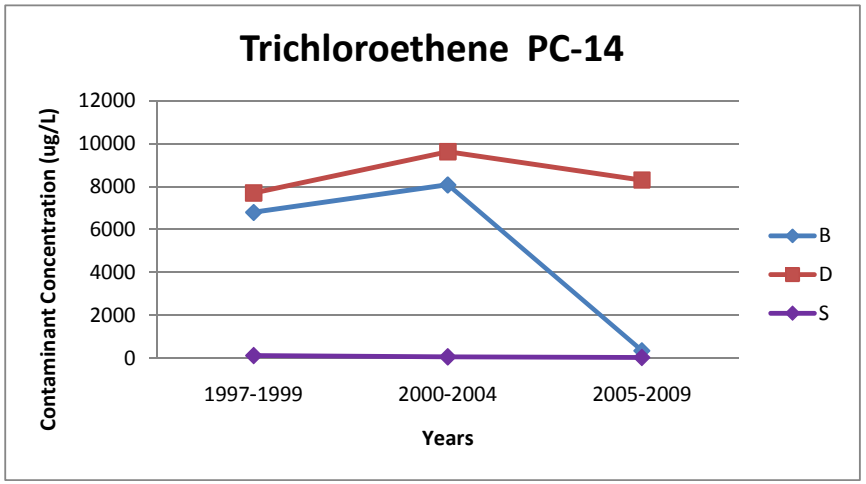
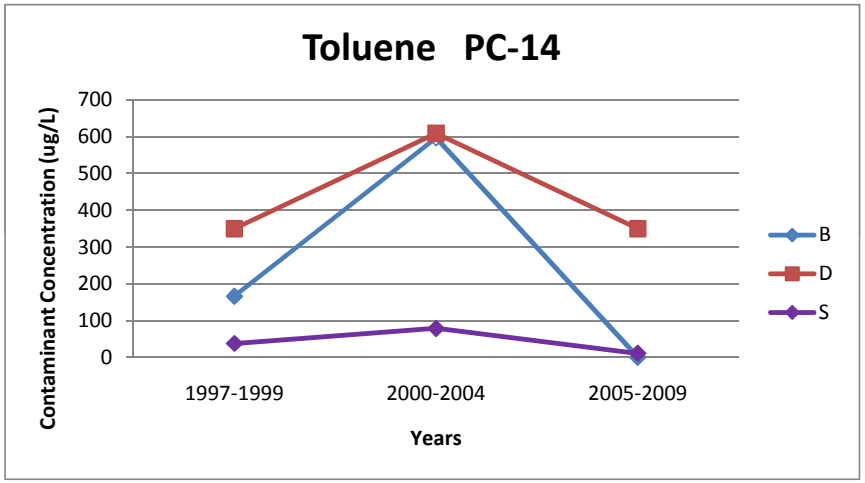


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 7 OF 9







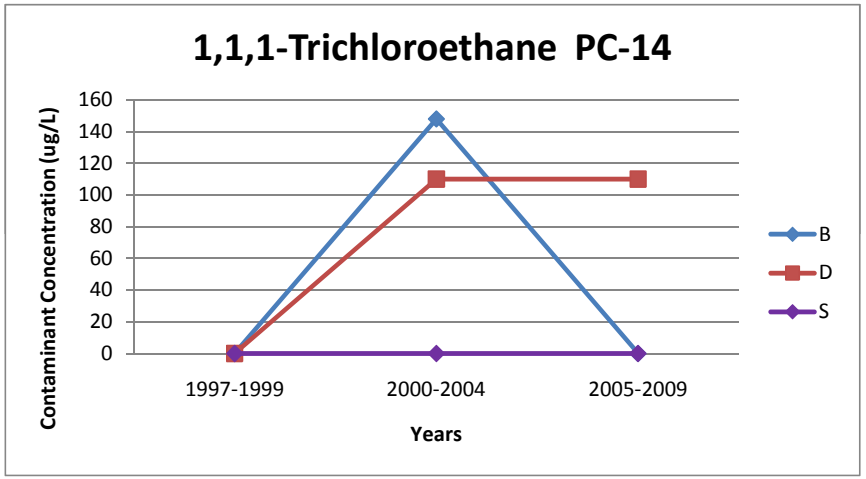
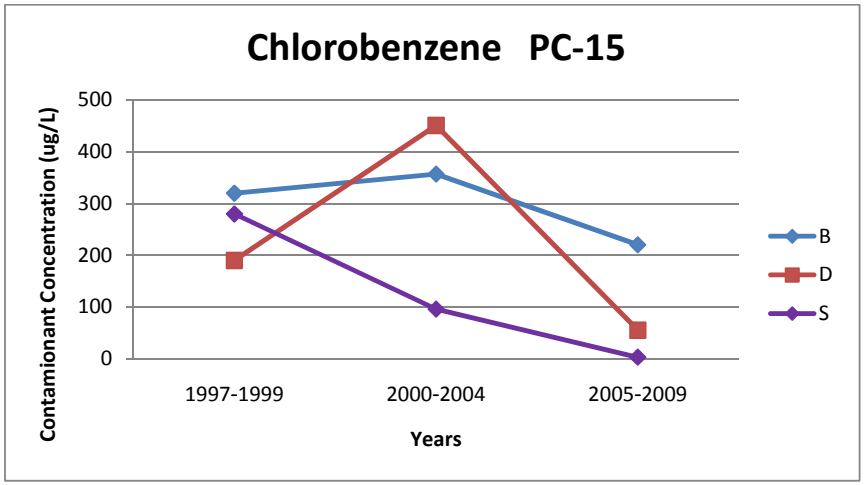
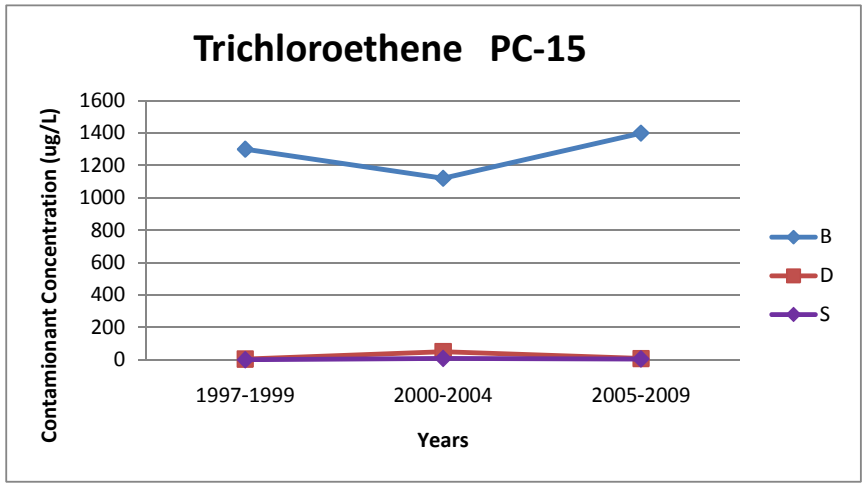
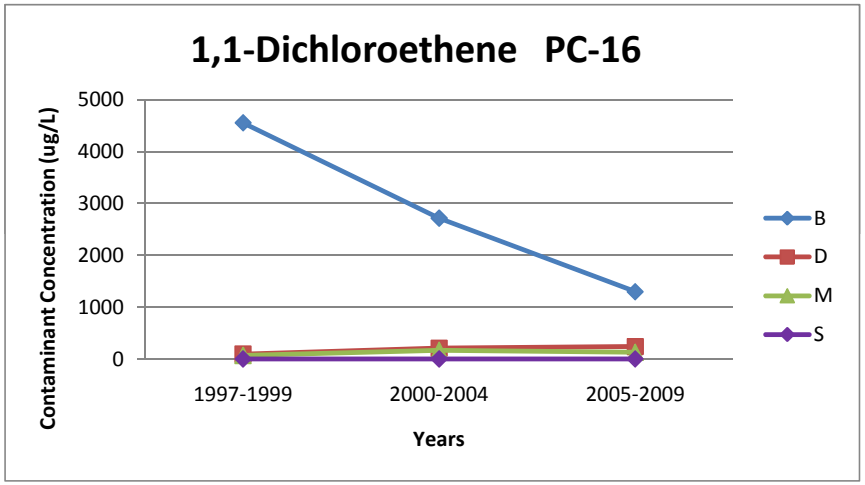


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT
PAGE 8 OF 9







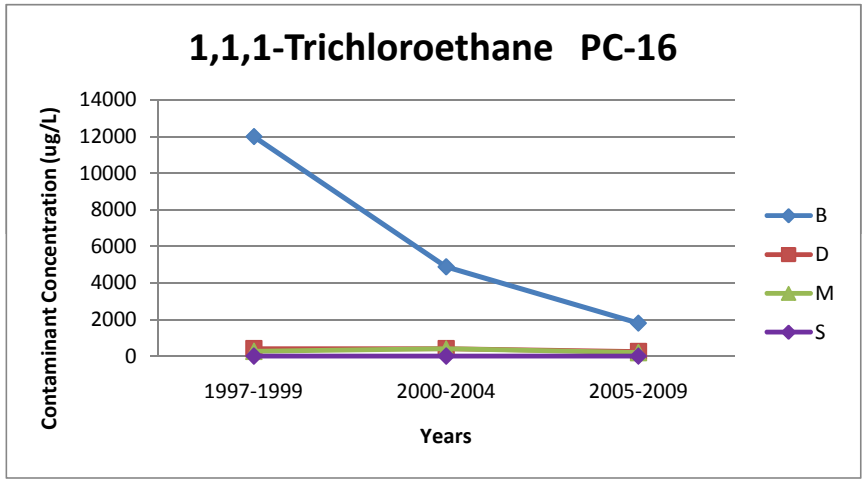
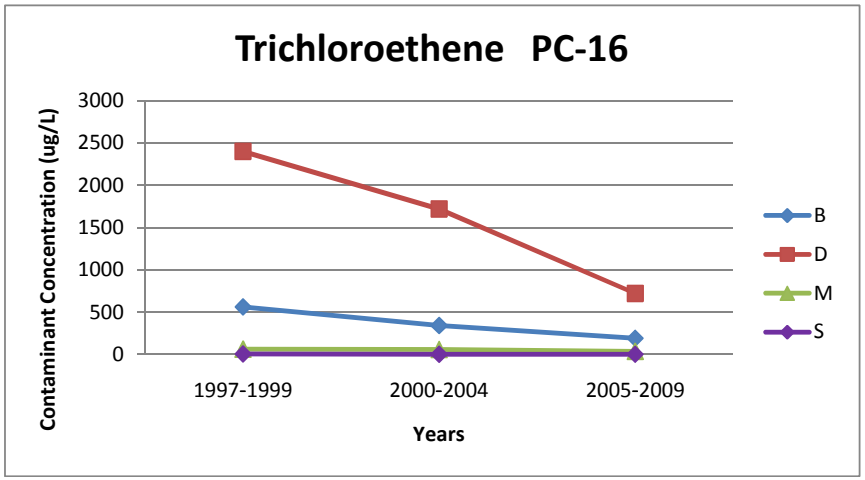
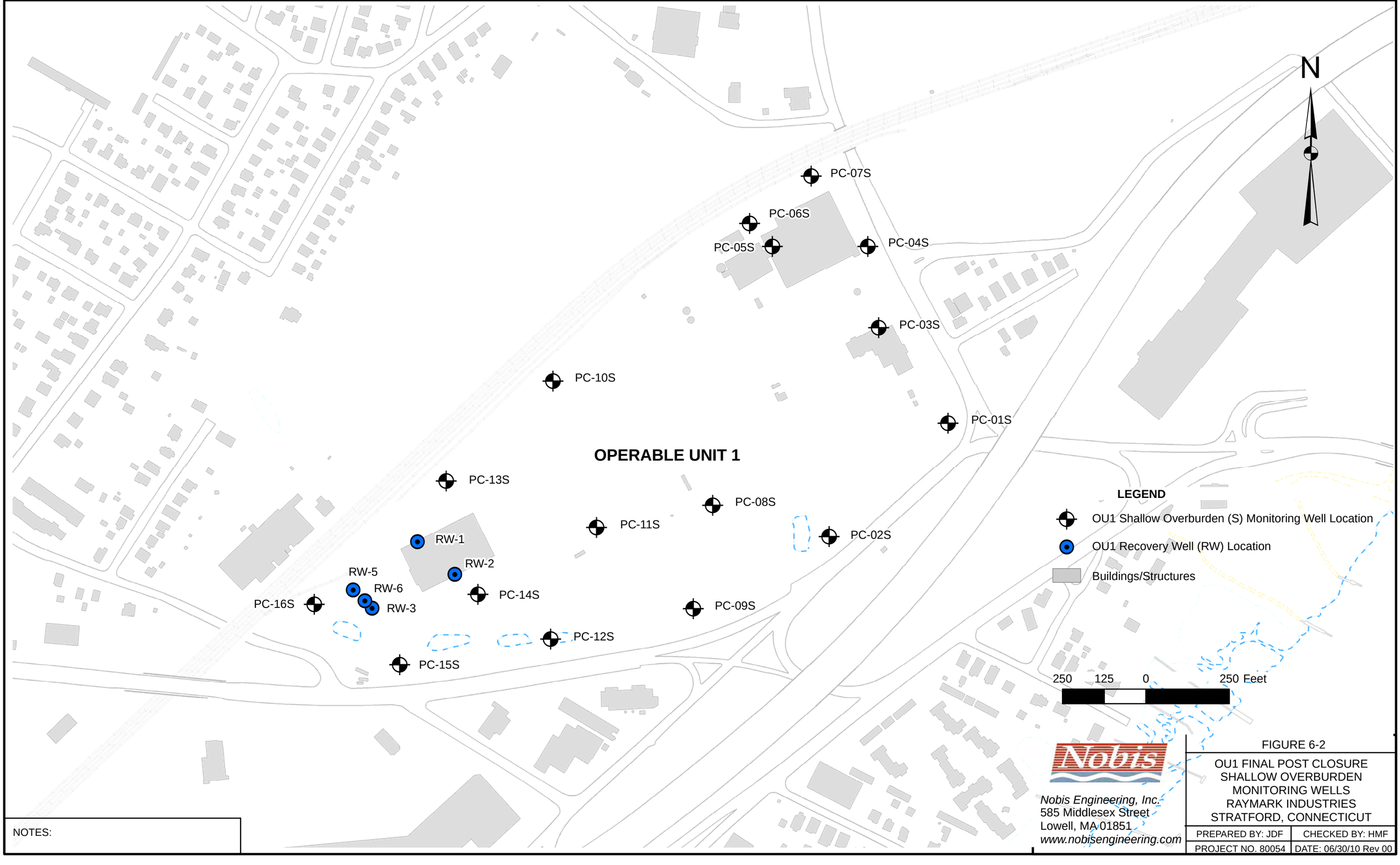


FIGURE 6-1
GROUNDWATER MONITORING DATA FOR SELECTED VOCS
FIVE-YEAR REVIEW
RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT



Notes: Aquifer Zone
B = Bedrock
D = Deep Overburden
M = Medium Overburden
S = Shallow Overburden



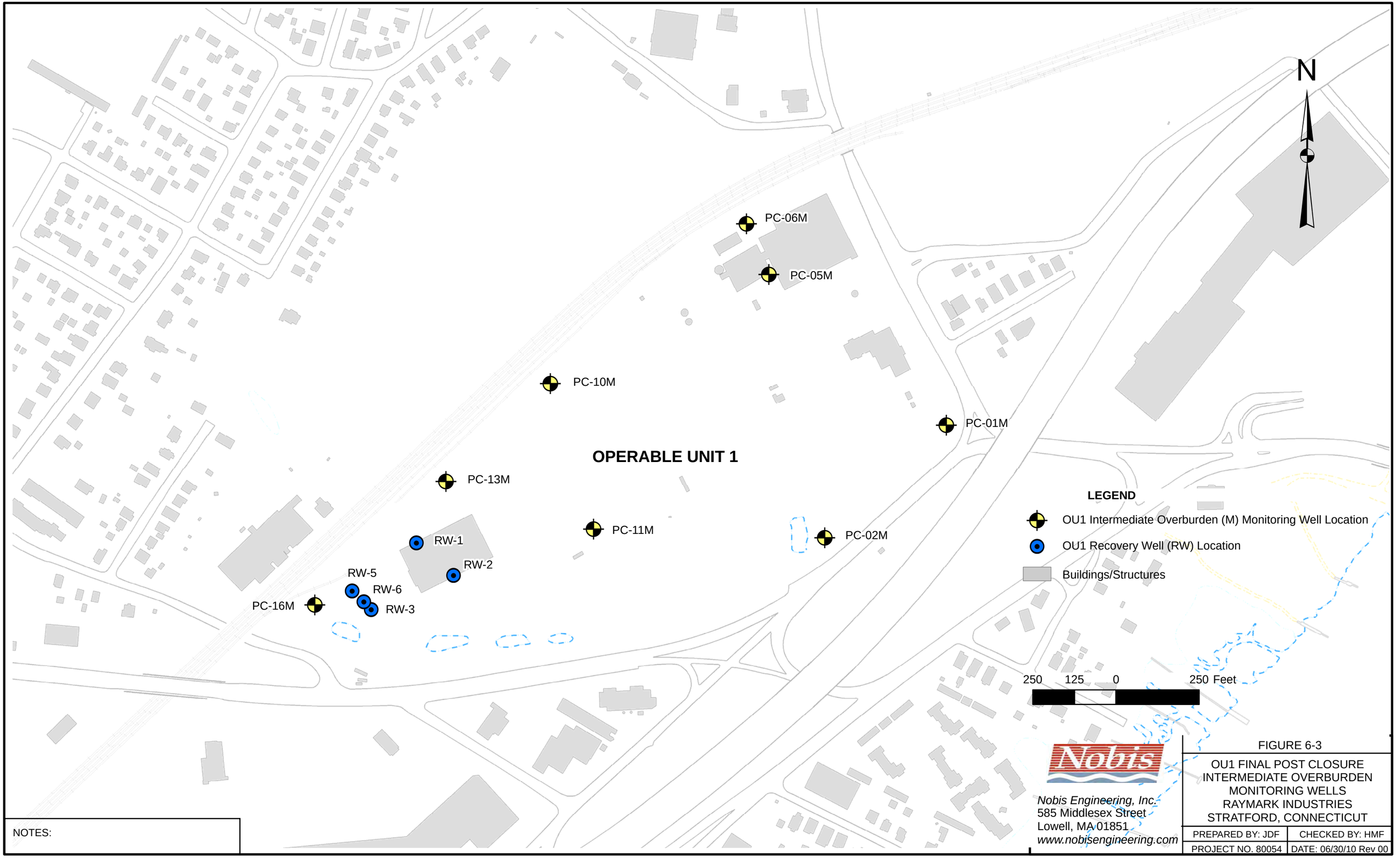
NOTES:

Nobis Engineering, Inc.
585 Middlesex Street
Lowell, MA 01851
www.nobisengineering.com

FIGURE 6-2

OU1 FINAL POST CLOSURE
SHALLOW OVERBURDEN
MONITORING WELLS
RAYMARK INDUSTRIES
STRATFORD, CONNECTICUT

PREPARED BY: JDF	CHECKED BY: HMF
PROJECT NO. 80054	DATE: 06/30/10 Rev 00



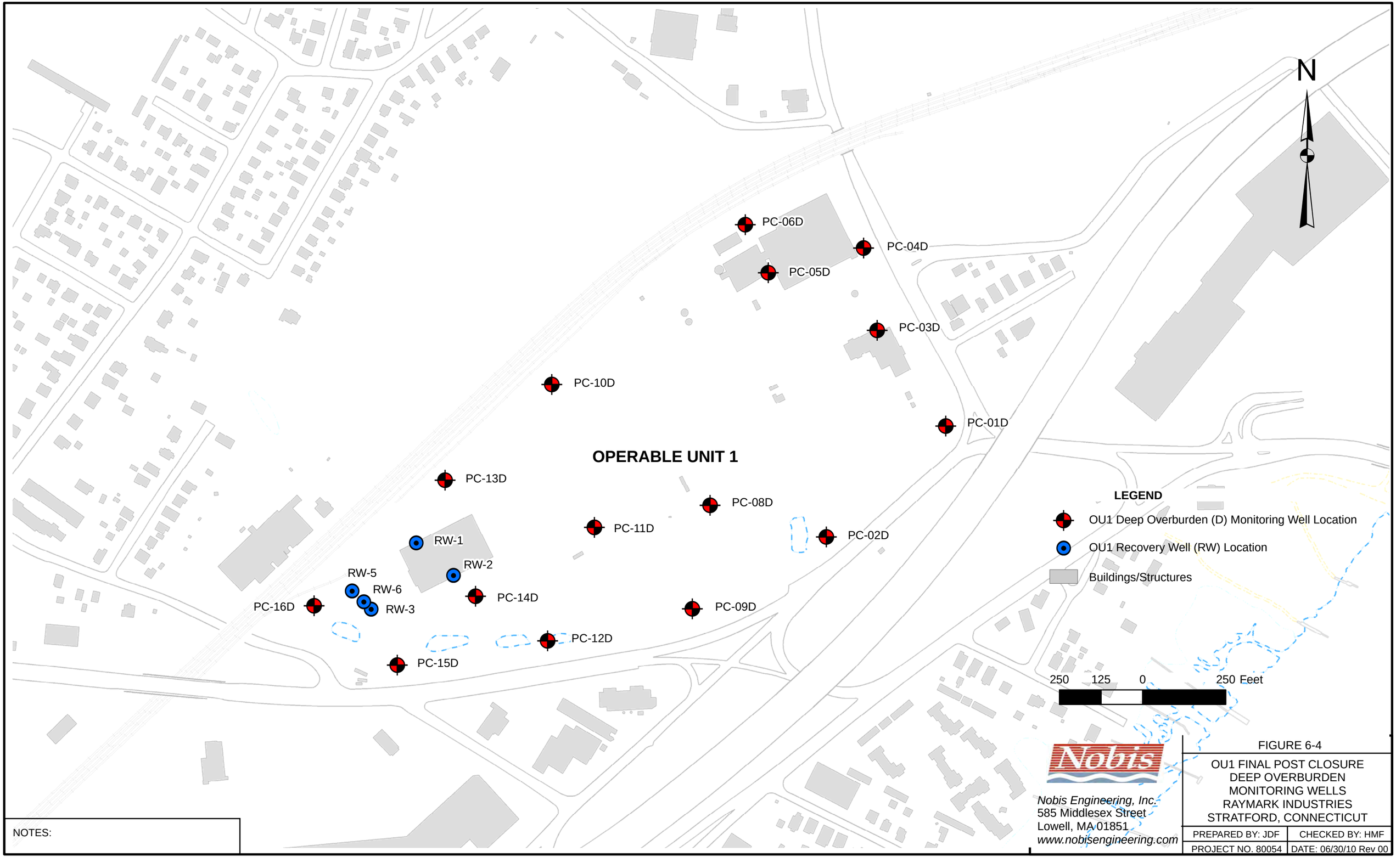
NOTES:

Nobis Engineering, Inc.
585 Middlesex Street
Lowell, MA 01851
www.nobisengineering.com

FIGURE 6-3

OU1 FINAL POST CLOSURE
INTERMEDIATE OVERBURDEN
MONITORING WELLS
RAYMARK INDUSTRIES
STRATFORD, CONNECTICUT

PREPARED BY: JDF	CHECKED BY: HMF
PROJECT NO. 80054	DATE: 06/30/10 Rev 00



NOTES:

Nobis Engineering, Inc.
585 Middlesex Street
Lowell, MA 01851
www.nobisengineering.com

FIGURE 6-4

OU1 FINAL POST CLOSURE
DEEP OVERBURDEN
MONITORING WELLS
RAYMARK INDUSTRIES
STRATFORD, CONNECTICUT

PREPARED BY: JDF	CHECKED BY: HMF
PROJECT NO. 80054	DATE: 06/30/10 Rev 00

N

PC-06B

PC-04B

PC-05B

PC-03B

PC-10B

PC-01B

OPERABLE UNIT 1

PC-13B

PC-08B

PC-11B

PC-02B

RW-1

RW-2

RW-5

RW-6

RW-3

PC-16B

PC-14B

PC-12B

PC-15B

LEGEND

OU1 Bedrock (B) Monitoring Well Location

OU1 Recovery Well (RW) Location

Buildings/Structures

250 125 0 250 Feet

NOTES:

Nobis Engineering, Inc.
585 Middlesex Street
Lowell, MA 01851
www.nobisengineering.com

FIGURE 6-5

OU1 FINAL POST CLOSURE
BEDROCK
MONITORING WELLS
RAYMARK INDUSTRIES
STRATFORD, CONNECTICUT

PREPARED BY: JDF	CHECKED BY: HMF
PROJECT NO. 80054	DATE: 06/30/10 Rev 00

APPENDIX A

INTERVIEW LIST, SITE INSPECTION CHECKLIST, AND PUBLIC NOTICES

INTERVIEW LIST

INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Ronald Curran	CTDEP Project Manager	CT Dept. of Env. Protection	5/10/10
Sarah Perhala	Environmental Scientist	AECOM	5/10/10
Scott Gish	Environmental Technician/Drafter	AECOM	5/10/10

INSPECTION CHECKLIST

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Raymark Industries, Inc. Superfund Site	**Date of inspection:** May 10, 2010
Location and Region: Stratford, CT; Region 1	**EPA ID:** CTD001186618
Agency, office, or company leading the five-year review: Environmental Protection Agency (EPA)	**Weather/temperature:** N/A

Remedy Includes: (Check all that apply)

- ☑ Landfill cover/containment
- ☑ Access controls
- ☑ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☑ Other: NAPL extraction system
- ☑ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☑ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Ronald Curran (Name) CTDEP Project Manager (Title) 5/10/2010 (Date)

Interviewed ☑ at site ☐ at office ☐ by phone Phone no. (860) 424-3764
Problems, suggestions; ☐ Report attached Indicated that NAPL recovery wells are collecting minimal amounts of NAPL. Mr. Curran also noted that the on-site equipment is aging and might need replacing in the future.

2. **O&M staff** Sarah Perhala (Name) Environmental Scientist (Title) 5/10/2010 (Date)

Interviewed ☑ at site ☐ at office ☐ by phone Phone no. (860) 263-5800
Problems, suggestions; ☐ Report attached Indicated that NAPL recovery wells are collecting minimal amounts of NAPL.

O&M staff Scott Gish (Name) Environmental Technician Drafter (Title) 5/10/2010 (Date)

Interviewed ☑ at site ☐ at office ☐ by phone Phone no. (860) 263-5768
Problems, suggestions; ☐ Report attached Indicated that NAPL recovery wells are collecting minimal amounts of NAPL.

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency CTDEP
Contact Ronald Curran (Name) | CTDEP Project Manager (Title) | 5/10/2010 (Date) | (860) 424-3764 (Phone no.)
Problems; suggestions; ☐ Report attached Please see Mr. Curran's response above.

Agency AECOM
Contact Scott Gish (Name) | Environmental Technician Drafter (Title) | 5/10/2010 (Date) | (860) 263-5768 (Phone no.)
Problems; suggestions; ☐Report attached Please see Mr. Gish's response above.

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone no.)
Problems; suggestions; ☐Report attached _____

Agency _____
Contact _____ (Name) | _____ (Title) | _____ (Date) | _____ (Phone no.)
Problems; suggestions; ☐ Report attached _____

4. **Other interviews** (optional) ☐ Report attached.

A meeting was conducted on March 21, 2010 to discuss the Raymark Industries Inc. Superfund Site, specifically redevelopment potential on various OUs throughout Stratford, CT. Mayor John Harkins, the new Chief Administration Officer, Geen Thazhampallath, and Andrea Boissevain from the Heath Department were in attendance at this meeting. No problems were identified at this meeting.

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☑ O&M manual — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☑ Maintenance logs — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks _____

2. **Site-Specific Health and Safety Plan**[1] — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☑ Contingency plan/emergency response plan — ☐ Readily available — ☑ Up to date — ☐ N/A

   Remarks _____

3. **O&M and OSHA Training Records** — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

4. **Permits and Service Agreements**[1]
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

5. **Gas Generation Records**[1] — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

7. **Groundwater Monitoring Records**[1] — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

8. **Leachate Extraction Records**[1] — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☑ N/A
   - ☑ Water (effluent) — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks _____

10. **Daily Access/Security Logs**[1] — ☐ Readily available — ☐ Up to date — ☑ N/A

    Remarks _____

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

IV. O&M COSTS

1. **O&M Organization**

☑ State in-house ☑ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**

☑ Readily available ☑ Up to date
☑ Funding mechanism/agreement in place
Original O&M cost estimate: Please see Attachment 1. ☑ Breakdown attached

Total annual cost by year for review period if available

From	2005 (Date)	To	2006 (Date)	$259,000 (Total cost)	☑ Breakdown attached
From	2006 (Date)	To	2007 (Date)	$307,000 (Total cost)	☑ Breakdown attached
From	2007 (Date)	To	2008 (Date)	$261,000 (Total cost)	☑ Breakdown attached
From	2008 (Date)	To	2009 (Date)	$257,000 (Total cost)	☑ Breakdown attached
From	2009 (Date)	To	2000 (Date)	$234,000 (Total cost)	☑ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: A sump pump cable was damaged on June 6, 2006 due to the installation of an electrical pole. The price to repair the sump pump cable was 90,000.

V. ACCESS AND INSTITUTIONAL CONTROLS ☑ Applicable ☐ N/A

A. Fencing[1]

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
Remarks: _____

B. Other Access Restrictions[1]

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks: _____

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1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☑ No ☐N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☑N/A

Type of monitoring (*e.g.*, self-reporting, drive by) Self-reporting
Frequency Weekly
Responsible party/agency State
Contact Ronald Curran (Name) | CTDEP Project Manager (Title) | 5/10/2010 (Date) | (860) 424-3764 (Phone no.)

Reporting is up-to-date ☑ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☑ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐ No ☐ N/A
Violations have been reported ☐Yes ☐ No ☑ N/A
Other problems or suggestions: ☐ Report attached
Institutional controls for the Site are included in the Record of Decision (ROD). There have been no reported violations from 2005 to 2010.

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks Institutional controls are strictly enforced.

D. General

1. **Vandalism/trespassing**[1] ☐ Location shown on site map ☐ No vandalism evident
Remarks

2. **Land use changes on site** ☐ N/A
Remarks Land use has changed at the OU1 property since the ROD was signed in 1995, but the changes were anticipated in the design of the remedy and have not changed or added any exposure routes.

3. **Land use changes off site**[1] ☐ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads[1] ☑ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A
Remarks

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1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS ☑ Applicable ☐ N/A

A. Landfill Surface[1]

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks _____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** ☐Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_____
   _____

7. **Bulges** ☐ Location shown on site map ☐Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

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1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident
	☐ Wet areas	☐ Location shown on site map Areal extent_____
	☐ Ponding	☐ Location shown on site map Areal extent_____
	☐ Seeps	☐ Location shown on site map Areal extent_____
	☐ Soft subgrade	☐ Location shown on site map Areal extent_____
	Remarks_____	
9.	**Slope Instability** ☐ Slides	☐ Location shown on site map ☐ No evidence of slope instability
	Areal extent_____	
	Remarks_____	
B. Benches[1]	☑ Applicable ☐ N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)	
1.	**Flows Bypass Bench**	☐ Location shown on site map ☐ N/A or okay
	Remarks_____	
2.	**Bench Breached**	☐ Location shown on site map ☐ N/A or okay
	Remarks_____	
3.	**Bench Overtopped**	☐ Location shown on site map ☐ N/A or okay
	Remarks_____	
C. Letdown Channels	☐ Applicable ☑ N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)	
1.	**Settlement**	☐ Location shown on site map ☐ No evidence of settlement
	Areal extent_____ Depth_____	
	Remarks_____	
2.	**Material Degradation**	☐ Location shown on site map ☐ No evidence of degradation
	Material type_____ Areal extent_____	
	Remarks_____	
3.	**Erosion**	☐ Location shown on site map ☐ No evidence of erosion
	Areal extent_____ Depth_____	
	Remarks_____	

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1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____
_____

5. **Obstructions** Type_____
☐ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____
_____

6. **Excessive Vegetative Growth** Type_____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____
_____

D. Cover Penetrations[1] ☑ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____
_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☑ N/A
Remarks_____
_____

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1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

E. Gas Collection and Treatment ☑ Applicable ☑ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☑ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☑ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☑ N/A
   Remarks Monitoring of negative pressure under the cap in the gas vent sand layer in the soil gas collection (SGC) system verifies that the cap effectively prevents potential soil vapor intrusion into buildings constructed over the cap, therefore gas monitoring of adjacent homes or buildings is not necessary. Sub slab depressurization (SSD) systems are installed in homes over contaminated groundwater down-gradient of the Site to prevent vapor intrusion into homes._____

F. Cover Drainage Layer[1] ☑ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☑ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

H. Retaining Walls ☐ Applicable ☑ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge[1] ☑ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** ☑ Functioning ☐ N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☑ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____
   _____

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

C. Treatment System ☑ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   - ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
   - ☐ Air stripping ☐ Carbon adsorbers
   - ☐ Filters_____
   - ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   - ☐ Others_____
   - ☑ Good condition ☐ Needs Maintenance
   - ☑ Sampling ports properly marked and functional
   - ☑ Sampling/maintenance log displayed and up to date
   - ☑Equipment properly identified
   - ☐ Quantity of groundwater treated annually_____
   - ☐ Quantity of surface water treated annually_____

   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☑ Good condition ☐ Needs Maintenance

   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☑ Good condition ☐ Proper secondary containment ☐ Needs Maintenance

   Remarks NAPL recovery tank was replaced in 2005 due to a leak caused by the acidic pH of the tank contents, which was detected during a routine inspection._____

4. **Discharge Structure and Appurtenances**[1]
   ☐ N/A ☐ Good condition ☐ Needs Maintenance

   Remarks_____

5. **Treatment Building(s)**
   ☐ N/A ☑ Good condition (esp. roof and doorways) ☐ Needs repair
   ☐Chemicals and equipment properly stored

   Remarks_____

6. **Monitoring Wells**[1] (pump and treatment remedy)
   - ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   - ☐ All required wells located ☐ Needs Maintenance ☐ N/A

   Remarks_____

D. Monitoring Data

1. Monitoring Data
   ☑ Is routinely submitted on time ☑ Is of acceptable quality

2. Monitoring data suggests:
   ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

   Remarks Contaminant concentrations are increasing in various wells on-site._____

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

D. Monitored Natural Attenuation

1. **Monitoring Wells**[1] (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

The NAPL extraction system is an additional remedy at the Raymark site. Please see Attachment 2.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy is generally functioning as intended by the ROD. Construction of the source control remedy components (cap, SGC system, and NAPL collection system) is complete, and it has been confirmed that the remedy is functioning as designed. The NAPL collection system is functional, but is collecting minimal amounts of NAPL. Four of the five wells have not produced NAPL. The amount of NAPL recovered from the remaining well has been very low. A re-evaluation of NAPL recovery wells should be conducted to optimize NAPL recovery. Despite the low rate of NAPL recovery, the remedy remains protective of human health and the environment. The source control remedy relied on preventing direct contact with contamination and vapor intrusion into on-site buildings, and since the remedy is functioning as intended, the remedy remains protective of human health and the environment. The frequent site inspections by CTDEP, its consultants, the property managers, and its consultants, continually evaluate the effectiveness of the cap, and its attendant systems (on-site gas removal, NAPL removal, and groundwater sampling). The effective implementation of institutional controls has continued to ensure the integrity of the cap.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
No issues.

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. There are no issues that suggest the protectiveness of the remedy may be compromised in the future.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Perform a re-evaluation of NAPL recovery wells to optimize NAPL recovery and to determine whether the system should be modified to increase its effectiveness.

The Connecticut Department of Environmental Protection (CTDEP) assumed responsibility for the operation and maintenance (O&M) of OU1 from the Environmental Protection Agency (EPA) in 1998.

1. Not visually verified, but was discussed with CTDEP and state contractors (AECOM) during Site inspection.

Attachment 1: O&M Costs for Raymark OU1 and SSD systems

Year		Scope of Work Estimate ($)	Actual O&M Cost ($)	Analytical Cost ($)	Total Cost ($)*
From	To				
2005	2006	257,000	250,000	9,000	259,000
2006	2007	308,000	292,000	15,000	307,000**
2007	2008	276,000	253,000	8,000	261,000
2008	2009	295,000	252,000	5,000	257,000
2009	2010	288,000	218,000	16,000	234,000

* Does not include cost for electric power to operate the treatment systems which is billed directly to DEP.

** Does not include $90,000 for repair of the sump pump cable damaged during installation of an electrical pole on June 6, 2006.

Attachment 2: NAPL Recovery Wells Site Inspection Form

Recovery Wells (within surface area of landfill)

☑ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A

Remarks: The NAPL recovery wells are functioning as designed, yet are extracting minimal amounts of NAPL. Only recovery well (RW) 3 is extracting NAPL. It is recommended that NAPL well redevelopment occur to optimize NAPL recovery. Additionally, a solar powered pump was installed in RW-3 in June 2006.

INSPECTION TEAM ROSTER

The following is a list of individuals who inspected the Site for this five-year review.

Name	Title/Position	Organization	Date
Heather Ford	Senior Project Manager	Nobis Engineering, Inc.	5/10/10
Michelle Carbonneau	Staff Engineer	Nobis Engineering, Inc.	5/10/10
Cynthia Woods	Senior Risk Assessor	Avatar Environmental	5/10/10

PUBLIC NOTICES

EPA to Review Cleanup Progress at Raymark Industries Superfund Site

The United States Environmental Protection Agency (EPA) is conducting the third five year review of the performance of cleanup technologies in place at the site of the former Raymark Industries, Inc. facility on East Main Street in Stratford, CT. The site is currently the location of the Stratford Crossings Shopping Center which opened in 2002.

The five-year review is generally performed five years following the initiation of a Superfund response action and is repeated every succeeding five yeas at sites where waste has been capped in place and use of the site remains restricted. The review is a comprehensive evaluation of the site remedy which will include an evaluation of the results of the ongoing sampling and monitoring activities to assess the performance of the cleanup systems. EPA will also talk with local Stratford officials and citizens to gain a better understanding of local concerns.

The review team will evaluate the information gathered and then make a determination as to whether the remedy is protective or not protective of public health and the environment. After completion of the these activities, EPA will issue a Five-Year Review Report summarizing the findings with respect to the site. EPA determined that the cleanup was protective of human health and the environment following earlier Five Year Reviews in 2000 and 2005.

Raymark was a manufacturer of automotive brakes, clutch parts, and other friction components, primarily for the automotive industry. Raymark and its predecessors operated at a 34-acre parcel at 75 East Main Street in Stratford from 1919 until 1989 when operations ceased. Raymark's manufacturing waste was historically disposed of as fill at 75 East Main Street, at a minimum of 46 residential properties, and at numerous commercial and municipal properties in Stratford.

Please contact Jim Murphy of EPA (617-918-1028; murphy.jim@epa.gov) with any questions concerning the Five Year Review. More information about cleanup activities at the site may be found on the EPA New England web site at: www.epa.gov/region1/superfund/sites/Raymark EPA technical reports and documents are available for public review in the site information repository located at the Stratford Public Library, 2203 Main Street in Stratford, and at the EPA New England Records Center, One Post Office Square, Boston, MA 02109-3912 (617) 918-1440.

EPA United States Environmental Protection Agency New England

U.S. Environmental Protection Agency (EPA)
Raymark Superfund Site
Community Update

EPA Superfund Community Involvement **November 2008**

This community update provides you with information on the activities ongoing at the Raymark Superfund site in Stratford, CT.

The Stratford Crossings retail center now operates above the protective engineered cap at the site of the former Raymark facility on East Main Street.

Early in 2008, the U.S. Environmental Protection Agency (EPA) announced to the Stratford community that the agency was delaying the issuance of a proposed cleanup plan for a group of 24 residential, commercial, state, and municipal properties that contain Raymark waste. EPA had developed and evaluated a range of cleanup options that included capping properties in place, excavation with out-of-town disposal, and excavation with in-town consolidation. While EPA and the Connecticut Department of Environmental Protection (CTDEP) support excavation of waste from a broad range of properties with in-town consolidation at two large former Raymark disposal sites (former Raybestos ball field on Frog Pond Lane; Short Beach Park / Stratford Landfill on Dorne Drive), Stratford's elected officials and some citizens have clearly stated their opposition to in-town waste consolidation and their preference for out-of-town disposal.

In late July, EPA Regional Administrator, Bob Varney, and Connecticut DEP Commissioner, Gina McCarthy, met in Stratford with representatives of Save Stratford, former members of the Raymark Advisory Committee, and local elected state and town officials in an effort to find common ground on potential cleanup options to address the remaining Raymark waste locations in Stratford.

As a result of the meeting, the group, now called the Raymark Superfund Team, agreed to convene a series of weekly meetings with the intent of reaching consensus as described in the following Mission Statement:

We will work as a team to re-examine information available on the remaining Raymark cleanup challenges and develop both short term and long term strategies. The team will identify one or more options for short-term cleanup efforts utilizing currently available funds to address the most significant risks throughout the site, within the context of a comprehensive, longer-term cleanup strategy that builds on past efforts and maximizes opportunities for land reuse and the leveraging of possible additional federal, state, and private funds. The team will work to reach a consensus and present its strategy in a written document within 90 days.

Members of the public may attend and observe these weekly meetings which are being held at the Stratford Health Department, typically on Monday or Tuesday each week (check with the Stratford Health Department or EPA to confirm specific meeting dates and location). Meeting agenda topics have been selected to allow for a more thorough review and understanding of the issues identified by both the EPA and CTDEP and the Stratford community and to provide an opportunity for participants to attain a thorough understanding of the complex technical, legal, regulatory, and financial constraints relative to the development of feasible cleanup alternatives. Meetings topics have included the following:

continued >

Where do I get information about the Raymark Site as well as general Superfund information?

Information is available in the site repository in the reference section of the Stratford Public Library at 2203 Main Street. This repository contains general materials about EPA's Superfund program, Superfund laws, and many volumes of Raymark specific reports and data.

There is additional information about the Raymark Superfund Site on the internet:

Stratford Health Department pages of the Town of Stratford website:

www.townofstratford.com/raymark.shtm

EPA New England website for Raymark-specific information and past Raymark Bulletins:

www.epa.gov/region01/superfund/sites/raymark/bulletins.htm

EPA Headquarters Superfund website includes information about the clean-up process, technologies, risk assessment, laws and regulations, and other Superfund resources:

www.epa.gov/superfund/index.htm

- Superfund process and funding
- nature and extent of contamination at all Raymark waste locations throughout Stratford
- cleanup actions to date
- evaluation of human health and ecological risk from Raymark contamination
- key laws and regulations related to Superfund
- future reuse and redevelopment options for contaminated properties
- cleanup alternatives and estimated costs for long-term remedies
- community health and safety plans, including air monitoring, air borne risk
- Raymark Advisory Committee Recommendations

The current schedule calls for the Raymark Superfund Team to issue its recommended strategy by the end of November 2008, with outreach to the wider community to continue in 2009.

If I have a concern or want more information, whom do I contact?

Jim Murphy
EPA Community Involvement
617-918-1028 or
toll free 888-372-7341 ext.81028
murphy.jim@epa.gov

Ron Jennings
EPA Project Manager
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toll free 888-372-7341 ext. 81242
jennings.ron@epa.gov

Ron Curran
CTDEP Project Manager
860-424-3764
ronald.curran@ct.gov

Meg Harvey
CT Department of Public Health
860-509-7742
margaret.harvey@ct.gov

Andrea Boissevain
Stratford Health Department
203-385-4090
aboissevain@townofstratford.com

EPA to post warning signs

One immediate concern that has been raised at the Raymark Superfund Team meetings is the lack of appropriate postings or warning signs at the various Raymark waste locations in town. EPA has agreed to begin posting signs in the near future in consultation with CTDEP and property owners to warn citizens of potential short-term exposures to Raymark waste until the locations can be more fully addressed.

For more information please visit:

www.epa.gov/region01/superfund/sites/raymark

APPENDIX B

DOCUMENTS REVIEWED
AND REFERENCES CITED

DOCUMENTS REVIEWED

APPENDIX B

DOCUMENTS REVIEWED

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Tetra Tech NUS (TtNUS), 2005. Remedial Investigation, Raymark – OU9 – Short Beach Park and Stratford Landfill. Stratford, Connecticut. July 2005.

REFERENCES

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REFERENCES

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Tetra Tech NUS (TtNUS), 2005. Remedial Investigation, Raymark – OU9 – Short Beach Park and Stratford Landfill. Stratford, Connecticut. July 2005.

APPENDIX C

DESCRIPTION AND STATUS OF OTHER OPERABLE UNITS

The description, history, and current status of OUs 2 through 9 associated with Raymark Industries, Inc. Superfund Site are presented in Appendix C. Remedial Investigations (RIs), including human health risk assessments (HHRAs), have been issued for each of the OUs, some of which have been finalized and some have not. A draft Feasibility Study (FS) report was issued for OU5. EPA has issued a FS for OU6. A proposed plan has been issued for four of the twenty-four properties within OU6. To date, no other OUs have completed FSs and no RODs have been issued for any of these OUs. The following changes and potential changes in risk assessment methods and toxicity factors used in calculating risks during the HHRAs may impact the conclusions of the risk assessments:

- risk methods for evaluating mutagenic contaminants, such as PAHs;

- methods for evaluating risks from asbestos, including the possibility the less than 1 percent asbestos may present unacceptable risks;

- changes to toxicity values for TCE and other VOCs; and

- potential changes to toxicity values for dioxins, PCE, vinyl chloride, 1,1-DCE, and arsenic (EPA is currently conducting reviews of toxicity values for each of these contaminants).

The HHRAs identified actionable risks from exposures to surface contamination at OU3, OU4, OU5, OU6, OU7, OU8, and OU9. A non-time-critical removal action (NTCRA) was performed at OU5; however, surface contamination remains exposed to potential receptors at portions of this OU and at each of the other OUs.

See Figure 3-3 for the location of each OU.

OPERABLE UNIT (OU) 2

OU2 encompasses the groundwater beneath approximately 500 acres in Stratford, including the Raymark OU1 Site. The groundwater beneath OU1 was included in the OU2 investigation; therefore, the OU1 source control remedy only addressed the contaminated soils. Approximately half of the 500 acres are zoned as commercial, containing highways and business activities; the remaining area includes residences and water bodies. The focus of investigation in the OU2 area is groundwater that has become contaminated with VOCs and metals that appear to be attributable to the former Raymark Facility. No soils or sediments are included in this OU.

The OU2 study area is bounded by the Housatonic River to the east; just above Selby Pond to the south; Interstate-95 (I-95)/Blakeman Place to the southwest; Patterson Avenue to the northwest; and the East Main Street/Dock Shopping Center to the north. Most of the 500-acre OU2 study area is down-gradient of the former Raymark Facility and includes areas that may have been affected by wastewater discharge, surface water runoff, direct deposition of manufacturing waste, and groundwater contaminant migration from the former Raymark Facility. A portion of the OU2 study area includes an area where VOCs were found to be impacting indoor air. This indoor air area is down-gradient of the facility, within the groundwater study area.

A Draft Final Remedial Investigation (RI) Study was completed in November, 2000 (TtNUS 2000). Additional information was collected in 2002 and 2003 in order to fill data gaps identified in the Draft Final RI. EPA issued a Final RI report in January 2005 describing contamination and potential health risks for OU2 (TtNUS 2005). An OU2 Feasibility Study (FS) is currently in progress and is expected to be issued in 2011.

The RI report identified six source areas for groundwater contamination, including four from the former Raymark Facility, one that is up-gradient from the Facility, and one from Raymark waste located on a different property. The ultimate fate of the contaminant plumes from these sources is Ferry Creek or the Housatonic River. Since groundwater in the study area and surrounding areas is not used as a drinking water source, the primary pathways of potential human risks are inhalation of volatiles present in indoor air due to volatilization of groundwater contaminants through building foundations, direct contact with surface water contamination from migration of groundwater to Ferry Creek, and ingestion of shellfish from Ferry Creek that may be contaminated from the migration of groundwater.

In the fall of 2009, EPA conducted a comprehensive groundwater sampling program for OU2 including 552 wells/borings and covering over 500 acres including the OU1 property. Evaluation of the data is underway. Preliminary evaluation of the data indicates that contamination is still present and remains high in groundwater.

Sub Slab Depressurization Systems

The RI report found that residential homes near the Raymark Facility are located above a groundwater plume, and volatile organic compound concentrations in both shallow and deep groundwater are above the State of Connecticut volatilization criteria. Sampling results confirmed the presence of site-related VOCs inside residential homes. As a result of these studies, 121 homes located within the study area were offered sub slab depressurization systems (SSD); in 2003 and 2004 sub slab depressurization systems were installed in 106 homes (15 refused systems). CTDEP is responsible for the installation and maintenance of the systems.

A recent neighborhood-wide SSD system inspection/inventory was completed in September 2008. Of the 106 homes that received these systems, only two homes did not participate in the SSD system inspections, 540 Ferry Boulevard and 150 Riverview Place. Owners of these residences did not respond to CTDEP's request to inspect their internal or inaccessible systems. From this inspection, problems with the electrical system and the fans were recognized. Follow-up activities included replacement of non- functional blowers, corroded electrical switch boxes, replacement of broken or cracked blower covers, replacement of missing vent caps and screws, and re-caulking of deteriorated seals. These issues were addressed and systems maintenance was performed in December 2008, if necessary. It was also noted from this inspection that some residences removed their SSD systems from their household and have not replaced them. Additionally, new homeowners in existing households or recently built homes in the affected area do not have SSD systems because new owners do not know about the SSD systems and/or they are no longer provided by CTDEP.

See Attachment 1 and 2 for the SSD Field Inspections and Associated Maintenance Costs Table as well as pictures of the SSD systems. The RI report concluded that because the SSD systems prevent volatiles in groundwater from entering homes the risk from volatilization of contaminants present in groundwater has decreased with the installation of these systems.

Based on the CTDEP investigation and site visit, the following were identified as issues, which need to be resolved in the OU2 Feasibility Study:

1. Continue to provide routine maintenance and equipment repairs for the installed systems.
2. Maintain a list of properties in the area with and without the SSD systems.
3. Inform new homeowners of the need for the SSD systems.
4. Inform homeowners who originally refused SSD systems of the need for the SSD systems.
5. Offer systems to new homeowners in homes where previous owners refused systems.
6. Offer systems again to homeowners who originally refused SSD systems.
7. Evaluate new groundwater data to confirm that the area of potential indoor air impacts has not expanded.
8. Evaluate new groundwater contaminant levels to confirm that the area of potential indoor air impacts has not changed.
9. Identify whether EPA or CTDEP is responsible for O&M activities on the SSD systems.

Metcalf & Eddy, Inc.
860 North Main Street Extension, Wallingford, CT 06492
T 203.269.7310 • F 203.269.8788 www.m-e.aecom.com

November 4, 2008

Mr. Ronald Curran
Bureau of Water Protection and Land Reuse
State of Connecticut Department of Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127

Subject: Evaluation of SSD Systems
Former Raymark Industries Site

Dear Mr. Curran,

Enclosed for your review is a summary of the SSD system inspections that Metcalf & Eddy, Inc. | AECOM (M&E) performed in the Ferry Boulevard neighborhood during September and October 2008. The SSD systems are associated with the former Raymark Industries Superfund facility located in Stratford, Connecticut. Although many SSD systems have been in operation for less than 5-years, all accessible homes were inspected during this inspection event. These inspections were performed in accordance with M&E's Scope of Services, dated May 6, 2008.

Maintenance actions were recommended and prioritized based on severity of the conditions observed. The most notable issues identified were primarily wet, corroded electrical boxes and SSD fans that were inoperable. The recommended actions and costs for the moderate to high priority system upgrades are summarized in the table provided in Attachment 1. Photographs of selected SSD systems recommended for maintenance are provided as Attachment 2. The table also contains a cost summary of low priority SSD system repairs, as well as a general summary of conditions observed at homes where no repairs were deemed warranted.

There are two outstanding systems that have not yet been inspected. The homes are located at 540 Ferry Boulevard and 150 Riverview Place. The homeowners of these two residences have internal or otherwise inaccessible fans and have been unresponsive to repeated attempts made to reach their residences, both via telephone calls and letters mailed to them.

Upon your approval, M&E can coordinate with the CTDEP, the homeowners, and a contractor (where necessary) to perform the repairs proposed in the attached table. It is anticipated that M&E staff will perform the majority of the repair work, with the exception of electrical box replacement, for which M&E will oversee Oross Electrical Contractors to perform these repairs. M&E will prepare a summary memorandum for the work completed.

M&E recommends that the high priority maintenance activities be performed within one month, while the moderate priority maintenance activities be performed by the end of the

calendar year 2008. The remaining maintenance activities are relatively minor (ie., recaulking seals, etc.) and can be done at a later date, if needed; however, economies of scale may be realized if the minor repairs are conducted along with the moderate and high priority maintenance activities.

We would like to discuss the results of our evaluation and our recommendations for maintenance with you at your earliest convenience. Please feel free to contact me if you have any questions.

Very truly yours,

Metcalf & Eddy, Inc. | AECOM

Sarah Perhala
Environmental Scientist

w/Attachments

cc: Lucas A. Hellerich, Ph.D., P.E.
Scott Gish
File

Attachment 1

Summary Table of SSD System Field Inspections and Associated Maintenance Costs

Attachment 1-Summary Table
Field Inspections and Recommendations for SSD System Maintenance
Ferry Boulevard Neighborhood
September and October 2008
Former Raymark Industries Superfund Site
Stratford, Connecticut

House # (From Database)	Address	Homeowner	Date of Inspection	# Fans	# Covers	Problem(s)	Observations/Comments	Photograph Attached (See Attachment 2)	Photograph # (From Attachment 2)	Priority Level[1]	Recommended Actions	Estimated Cost for Moderate/High Priority Items
Homes with Moderate to High Priority SSD System Repairs Identified (Bold Italics Indicates High Priority)												
3	29 Burr Place	Frank Maco	9/12/2008	1	0	Electric Box	Significant corrosion also affecting wiring	Yes	1	High	Replace electric box	$250
8	470 Ferry Blvd. (Apt.Complex 2)	Wilfred J. Rodie Sr.	9/10/2008	2	2	Electric Box	Siginficant water intrusion in north electric box; only salt build-up in south	Yes	3	High	Replace electric box	$250
13	36 Homestead Avenue	Herbert Butler	9/11/2008	1	1	Electric Box	Water in electric box; new silicone caulk	Yes	4	High	Replace electric box	$250
15	63 Homestead Avenue	H & M Petrie	9/11/2008	1	1	Electric Box	Water in electric box	Yes	5	High	Replace electric box	$250
19	79 Homestead Avenue	Marina & Paul Byrne	9/11/2008	1	1	Vent Cap; Electric Box	No vent cap; water in electric box	Yes	6 & 7	High	Replace vent cap and electric box	$400
20	85 Homestead Avenue	Keith & Patricia Scheck	9/11/2008	2	2	Electric Box	Rear electric box water damaged	Yes	8	High	Replace electric box	$250
24	109 Homestead Avenue	Peter Bauer	9/11/2008	1	1	Fan; Electric Box	Water in electric box	Yes	9	High	Replace fan (GP 301) and electric box	$500
27	232 Housatonic Avenue	Roxanne and Chris Pruzizsh	9/12/2008	1	1	Electric Box	Very significant corrosion of electric box and wiring; screws are entirely rust	Yes	12	High	Replace electric box	$250
46	405 Housatonic Avenue	Katherine & Theodore (Ted) Rumovicz	9/11/2008	1	1	Electric Box	Significant rust and corrosion inside electric box impacting wiring	Yes	13	High	Replace electric box	$250
55	492 Housatonic Avenue	Joseph Michalek	9/11/2008	2	2	Screw missing; Electric Box	Screw and rubber seal missing in left electric box; moderate water intrusion in right electric box; cover cracked on right fan	Yes	14	High	Replace screw, fan cover, and electric box	$450
62	560 Housatonic Avenue	Robert M. Sr. & Sylvia Cronk	9/10/2008	2	2	Electric Box	Right electric box has significant corrosion but no water instrusion	Yes	15	High	Replace electric box	$250

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Ferry Boulevard Neighborhood
September and October 2008
Former Raymark Industries Superfund Site
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House # (From Database)	Address	Homeowner	Date of Inspection	# Fans	# Covers	Problem(s)	Observations/Comments	Photograph Attached (See Attachment 2)	Photograph # (From Attachment 2)	Priority Level[1]	Recommended Actions	Estimated Cost for Moderate/High Priority Items
67	56 Minor Avenue	John Kiely	9/10/2008	1	1	Electric Box	Moderate water instrusion and rust inside electric box; cover is cracked on one side	Yes	16	High	Replace electric box	$250
70	83 Minor Avenue	Nina Lucia and Rodney Smith	9/10/2008	1	0	Electric Box	Significant water intrusion inside electric box	Yes	18	High	Replace electric box	$250
86	135 Riverview Place	Gary F. Walker	9/30/2008	1	1	Electric Box	Significant rust and corrosion inside electric box impacting wiring	Yes	19	High	Replace electric box	$250
87	144 Riverview Place	Robert Verelley	9/12/2008	1	1	Electric Box	Water in electric box	No	-	High	Replace electric box	$250
89	24 Willow Avenue	Frederick Germano (lives)	9/12/2008	1	1	Electric Box	Water in electric box	Yes	20	High	Replace electric box	$250
93	73 Willow Avenue	Theodore and Amy Russell	9/12/2008	1	1	Electric Box	Water/salt in electric box	Yes	21	High	Replace electric box	$250
94	86 Willow Avenue	Kelli Toro	9/12/2008	1	1	Electric Box	Water in electric box; electric box not attached properly.	Yes	22	High	Replace electric box	$250
95	93 Willow Avenue	Muriel Jean Eastman	9/12/2008	1	0	Caulking; Electric Box	Water in electric box	Yes	23	High	Recaulk seals and replace electric box	$300
100	116 Willow Avenue	Kevin & Kathy Downs	9/12/2008	1	1	Electric Box	Water/rust in electric box	Yes	24	High	Replace electric box	$250
25	125 Homestead Avenue	Clare Marro	9/11/2008	1	1	Fan Casing	Fan casing broken - air and water leaks	Yes	10	High	Replace fan (GP 501)	$300
											Subtotal for High Priority System Maintenance:	***$5,950***
7	450 Ferry Blvd. (Apt.Complex 1)	Wilfred J. Rodie Sr.	9/10/2008	2	2	Cover	Cover severely damaged; minor salt build-up in electric box	Yes	2	Moderate	Recaulk seals and replace cover	$250
26	231 Housatonic Avenue	Thomas & Connie Kristy	9/12/2008	1	0	Vent cap & pipe	Fan in off position but working properly; vent pipe and cap severely damaged found laying in driveway	Yes	11	Moderate	Replace vent cap and piping	$200
35	309 Housatonic Avenue	Pat & Lou Provenzaro	9/12/2008	1	1	Fan	Fan not working; no apparent indication as to cause; very minor corrosion inside electric box	No	-	Moderate	Replace fan (GP 501)	$300

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Field Inspections and Recommendations for SSD System Maintenance
Ferry Boulevard Neighborhood
September and October 2008
Former Raymark Industries Superfund Site
Stratford, Connecticut

House # (From Database)	Address	Homeowner	Date of Inspection	# Fans	# Covers	Problem(s)	Observations/Comments	Photograph Attached (See Attachment 2)	Photograph # (From Attachment 2)	Priority Level[1]	Recommended Actions	Estimated Cost for Moderate/High Priority Items
47	415 Housatonic Avenue	Aletta-Lovejoy Troutman Current Owner: Jeff Hardy	9/11/2008	2	2	Fan	Left fan very slow to start, sounds muted when operating - not working properly and found in off position; right electric box has very minor rust.	No	-	Moderate	Replace fan (GP 501)	$300
48	429 Housatonic Avenue	George Mulligan	9/11/2008	1	1	Fan	Fan not working; no apparent indication as to cause	No	-	Moderate	Replace fan (RP 140)	$200
53	481 Housatonic Avenue	Tami Pocevic	9/11/2008	1	1	Fan	Fan not working; no apparent indication as to cause	No	-	Moderate	Replace fan (GP 501)	$300
60	520 Housatonic Avenue	Bill, Mary & Nick Avramopoulos	9/11/2008	2	0	2 fans	No apparent indication why both fans not operating properly	No	-	Moderate	Replace 2 fans (Both GP 501)	$600
61	550 Housatonic Avenue	Debbie & Paul Kuban		2	2	Alarm	Ladder required - owner permission obtained	No	-	Moderate	Replace alarm	$250
72	95 Minor Avenue	Edward Govan	9/10/2008	1	0	Fan	Fan not working; no apparent indication as to cause	No	-	Moderate	Replace fan (RP 140)	$200
77	50 Riverview Place	Judy Lipton (Owner: Raymond Martin)	9/30/2008	1	1	Fan	Fan not working; no apparent indication as to cause	No	-	Moderate	Replace fan (RP 140)	$200
80	80 Riverview Place	Richard Anthony	9/12/2008	1	1	Fan	Fan not working; no apparent indication as to cause	No	-	Moderate	Replace fan (GP 501)	$300
101	120 Willow Avenue	Thomas H. Legensky	9/30/2008	1	1	Caulking	Owner stated system freezes up in winter; no access to electric box (inside cover) without destroying large bush	Yes	25	Moderate	Trim bush (with owners permission), inspect interior electrical box, and repair as necessary; recaulk seals	$100

Subtotal for Moderate Priority System Maintenance: **$3,200**
Total Moderate and High Priority System Maintenance: **$9,150**
Say: **$9,200**

Notes:
1) Priority levels are assigned based on following guidelines:
High: Problem is recommended to be addressed within 1 month
Moderate: Problem is recommended to be addressed within 2 months
Low: Problem is recommended to be addressed within 6 months
2) Totals assume travel time for up to 6 SSD system repairs per day and some additional time for M&E to obtain/order parts
3) Some fans may be covered under warranty, and therefore no additional charges may be incurred at some locations. This cannot be determined until fans are removed and sent back to manufacturer

Attachment 1-Summary Table
Field Inspections and Recommendations for SSD System Maintenance
Ferry Boulevard Neighborhood
September and October 2008
Former Raymark Industries Superfund Site
Stratford, Connecticut

House # (From Database)	Address		Homeowner	Date of Inspection	# Fans	# Covers	Problem(s)	Observations/Comments	Photograph Attached (See Attachment 2)	Photograph # (From Attachment 2)	Priority Level[1]	Recommended Actions	Estimated Cost for Moderate/High Priority Items
Homes with Low Priority Repairs Identified													
1	11	Burr Place	John and Laurana Campbell	9/12/2008	1	0	Caulking	Significant moisture and mold growth between fan casing and vent piping	No	-	Low	Recaulk seals	$75
5	40	Burr Place	Alan & Jacki Bonaparte	9/10/2008	1	0	Caulking	-	No	-	Low	Recaulk seals	$75
16	64	Homestead Avenue	Barbara Wendel	9/11/2008	1	1	Seals	No seals or caulk from fan to vent line	No	-	Low	Recaulk seals	$75
18	76	Homestead Avenue	Marcy & Tod Anderson	9/11/2008	1	1	Caulking	Cracked caulking but no noticeable air leaks	No	-	Low	Recaulk seals	$75
33	273	Housatonic Avenue	Timothy & Paula Murphy	9/12/2008	1	0	Caulking	-	No	-	Low	Recaulk seals	$75
34	304	Housatonic Avenue	William Loxsom (wife = carla?)	9/12/2008	1	0	Caulking	-	No	-	Low	Recaulk seals	$75
39	337	Housatonic Avenue	Charles & Christine Kopin	9/12/2008	1	0	Caulking	Owner stated that significant water runoff from roof hits fan	No	-	Low	Recaulk seals	$75
42	355	Housatonic Avenue	Jennifer J. & Douglas B. Bridge Jr. Louis James (mother who lives in house & contact)	9/12/2008	1	0	Caulking	Very minor corrosion and salt build-up inside electric box	No	-	Low	Recaulk seals	$75
44	375	Housatonic Avenue	Laura L. Gates	9/11/2008	2	0	Caulking	Very minor rust inside right electric box	No	-	Low	Recaulk seals	$75
52	472	Housatonic Avenue	Joseph L. Mason	9/11/2008	1	0	Screw missing	-	No	-	Low	Replace screw	$50
56	498	Housatonic Avenue	Mary Ann Reichlen	9/18/2008	2	1	Caulking	Fan is under deck but still exposed to rainfall	No	-	Low	Recaulk seals	$75
57	501	Housatonic Avenue	Maria and N.E. Arteaga	9/11/2008	1	1	Screw missing	-	No	-	Low	Replace screw	$50
69	76	Minor Avenue	Mark Poremba	9/30/2008	1	1	Cover	One side of cover severely damaged	Yes	17	Low	Replace cover	$200
71	86	Minor Avenue	Peter & Robin Hines	9/10/2008	1	0	Caulking	-	No	-	Low	Recaulk seals	$75
98	107	Willow Avenue	Donald R. Budde	9/12/2008	1	0	Caulking	-	No	-	Low	Recaulk seals	$75

Subotal for Low Priority Maintenance:	**$1,200**
Total SSD System Repairs with High, Moderate, and Low Priority Repairs:	**$10,350**
Say:	**$10,400**

Notes:
1) Priority levels are assigned based on following guidelines:
High: Problem is recommended to be addressed within 1 month
Moderate: Problem is recommended to be addressed within 2 months
Low: Problem is recommended to be addressed within 6 months
2) Total assumes travel time for up to 6 SSD system repairs per day and some additional time for M&E to obtain/order parts

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Homes with no Identified Repairs Necessary												
2	20 Burr Place	Loretta Firkey	9/12/2008	1	0	-	-	No	-	-	-	
4	30 Burr Place	Margaret & John McHugh	9/10/2008	2	2	-	Very minor rust in left electric box where screwed in; also minor salt build-up	No	-	-	-	
6	49 Burr Place	Tom & Michele Zimnoch	9/10/2008	1	0	-	Very minor corrosion inside electric box	No	-	-	-	
9	540 Ferry Blvd.	Mark Hull	-	1	0	-	Internal fan - need appointment - owner is not responsive	No	-	-	-	
10	550 Ferry Blvd.	Liberato Della Gioia	9/12/2008	2	2	-	-	No	-	-	-	
11	570 Ferry Blvd.	Danielle Della Gioia	9/12/2008	1	0	-	Very minor rust corrosion inside electric box	No	-	-	-	
12	30 Homestead Avenue	Norman Parker	9/11/2008	1	1	-	-	No	-	-	-	
14	42 Homestead Avenue	Justin Dupray	9/11/2008	1	1	-	-	No	-	-	-	
17	71 Homestead Avenue	Michael & Jo-Ann Horwath	9/11/2008	1	1	-	New fan and switch had been installed	No	-	-	-	
21	93 Homestead Avenue	Alicia & Eugene Moral	9/30/2008	1	1	-	Very minor rust corrosion inside electric box	No	-	-	-	
22	96 Homestead Avenue	Ron Tichy (pronounced Ticky)	9/11/2008	1	1	-	-	No	-	-	-	
23	108 Homestead Avenue	Charles D. Cambra	9/11/2008	1	1	-	-	No	-	-	-	
28	239 Housatonic Avenue	Joseph Vernuccio	9/30/2008	1	1	-	-	No	-	-	-	
29	251 Housatonic Avenue	Daniel Horowitz	9/12/2008	1	0	-	-	No	-	-	-	
30	252 Housatonic Avenue	Anita Flanagan	9/12/2008	2	0	-	-	No	-	-	-	
31	262 Housatonic Avenue	Eugene & Scott Wall	9/12/2008	1	1	-	-	No	-	-	-	
32	263 Housatonic Avenue	Joseph Warmke	9/12/2008	1	0	-	-	No	-	-	-	
36	320 Housatonic Avenue	Frank Lecardo	9/12/2008	2	2	-	-	No	-	-	-	

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37	328 Housatonic Avenue	Sue & Milton Bond	9/12/2008	1	0	-	-	No	-	-	-	
38	331 Housatonic Avenue	Ted Littlejohn & Joanne Libby	9/12/2008	1	1	-	-	No	-	-	-	
40	338 Housatonic Avenue	Ken Hawks		2	2	-	-	No	-	-	-	
41	348 Housatonic Avenue	Debra Blackwelder	9/12/2008	0	0	-	House is new construction; fans not installed on new house.	No	-	-	-	
43	364 Housatonic Avenue	Evelyn Stein	9/11/2008	1	0	-	Very minor rust inside electric box	No	-	-	-	
45	395 Housatonic Avenue	Lorraine & Charles Tesla	9/11/2008	1	0	-	Very minor rust where electric box screws in	No	-	-	-	
49	434 Housatonic Avenue	W. & Britt Huges	9/11/2008	1	1	-	-	No	-	-	-	
50	462 Housatonic Avenue	John & Laurie Goodsell	9/11/2008	1	0	-	Fan inside shed; Owner permitted access	No	-	-	-	
51	471 Housatonic Avenue	David and Linda Geffrey	9/11/2008	1	0	-	-	No	-	-	-	
54	489 Housatonic Avenue	Joseph Michalek	9/11/2008	1	1	-	-	No	-	-	-	
58	509 Housatonic Avenue	Sherri & Robert Novak	9/11/2008	1	0	-	-	No	-	-	-	
59	515 Housatonic Avenue	Gary M. Parker	9/11/2008	1	0	-	Fan is working, but bolted to off position	No	-	-	-	
63	580 Housatonic Avenue	William Turnor & Joan Wootton	9/30/2008	1	1	-	-	No	-	-	-	
64	600 Housatonic Avenue	Paul Nortan	9/30/2008	2	2	-	-	No	-	-	-	
65	605 Housatonic Avenue	Kaz Augustyn	9/30/2008	2	2	-	-	No	-	-	-	
66	49 Minor Avenue	Barbara M. Shea	9/10/2008	1	1	-	-	No	-	-	-	
68	72 Minor Avenue	Josephine Faggella (son-Vincent-power of attorney)	9/10/2008	1	0	-	-	No	-	-	-	
73	96 Minor Avenue	Christopher Chinova	9/10/2008	1	0	-	Some corrosion on front of fan casing; does not appear to affect performance	No	-	-	-	
74	105 Minor Avenue	Karen & Tony Arena	9/10/2008	1	0	-	-	No	-	-	-	

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75	113 Minor Avenue	Lee Gobbi & Susanna	9/12/2008	1	0	-	-	No	-	-	-	
76	40 Riverview Place	Robin Forgette	9/12/2008	1	1	-	No electrical switch	No	-	-	-	
78	61 Riverview Place	Kathleen Courtney	9/12/2008	1	0	-	-	No	-	-	-	
79	65 Riverview Place	Ana Julia and Jose Lainez	9/12/2008	1	1	-	-	No	-	-	-	
81	89 Riverview Place	Mark A. Sharnick	9/12/2008	2	2	-	Very minor corrosion in both electric boxes	No	-	-	-	
82	95 Riverview Place	Raymond Wauthier	9/12/2008	1	1	-	-	No	-	-	-	
83	99 Riverview Place	Amy Cheek	9/12/2008	1	1	-	Very minor corrosion inside electric box	No	-	-	-	
84	100 Riverview Place	David S. Neilson	9/12/2008	1	1	-	-	No	-	-	-	
85	111 Riverview Place	Eugene Cecere	9/12/2008	1	1	-	-	No	-	-	-	
88	150 Riverview Place	Susan Linsley	-	-	-	-	Fan is inaccessible - need appointment - owner is not responsive	No	-	-	-	
90	44 Willow Avenue	Kim and Cindy	9/12/2008	1	1	-	-	No	-	-	-	
91	53 Willow Avenue	Richard and Loretta Kolvig	9/12/2008	1	1	-	-	No	-	-	-	
92	68 Willow Avenue	John & Rose Rich	9/12/2008	1	1	-	-	No	-	-	-	
96	96 Willow Avenue	Cornelia Hull	9/12/2008	1	1	-	-	No	-	-	-	
97	106 Willow Avenue	Wilfred A. & Kelly M. Masse	9/12/2008	1	1	-	-	No	-	-	-	
99	115 Willow Avenue	Leo McBride	9/12/2008	1	0	-	-	No	-	-	-	
102	126 Willow Avenue	Windy Reid	9/12/2008	1	1	-	-	No	-	-	-	
103	128 Willow Avenue	Ruth Meyer	9/12/2008	1	1	-	-	No	-	-	-	
104	145 Willow Avenue	Walter Killian	9/12/2008	1	1	-	-	No	-	-	-	

Attachment 2

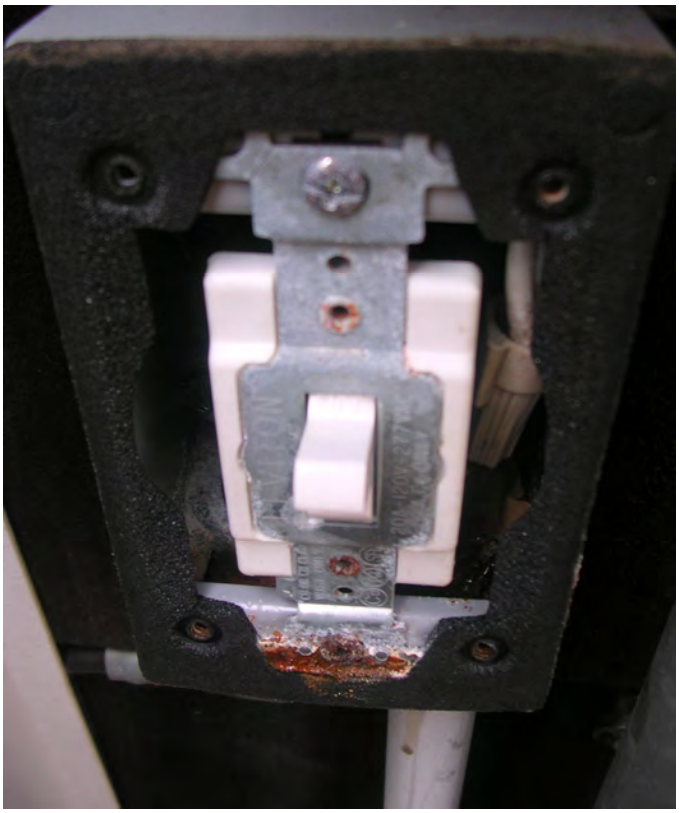
Photographs of Residential SSD Systems

Photograph 1) House #3 – 29 Burr Place: Electric Box

Photograph 2) House #7 – 450 Ferry Boulevard: Cover

Photograph 3) House #8 – 470 Ferry Boulevard: Electric Box

Photograph 4) House #13 – 36 Homestead Avenue: Electric Box



Photograph 5) House #15 – 63 Homestead Avenue: Electric Box

Photograph 6) House #19 – 79 Homestead Avenue: Vent Cap

Photograph 7) House #19 – 79 Homestead Avenue: Electric Box

Photograph 8) House #20 – 85 Homestead Avenue: Electric Box

Photograph 9) House #24 – 109 Homestead Avenue: Electric Box

Photograph 10) House #25 – 125 Homestead Avenue: Fan Casing

Photograph 11) House #26 – 231 Housatonic Avenue: Vent Pipe and Cap

Photograph 12) House #27 – 232 Housatonic Avenue: Electric Box

Photograph 13) House #46 – 405 Housatonic Avenue: Electric Box

Photograph 14) House #55 – 492 Housatonic Avenue: Electric Box

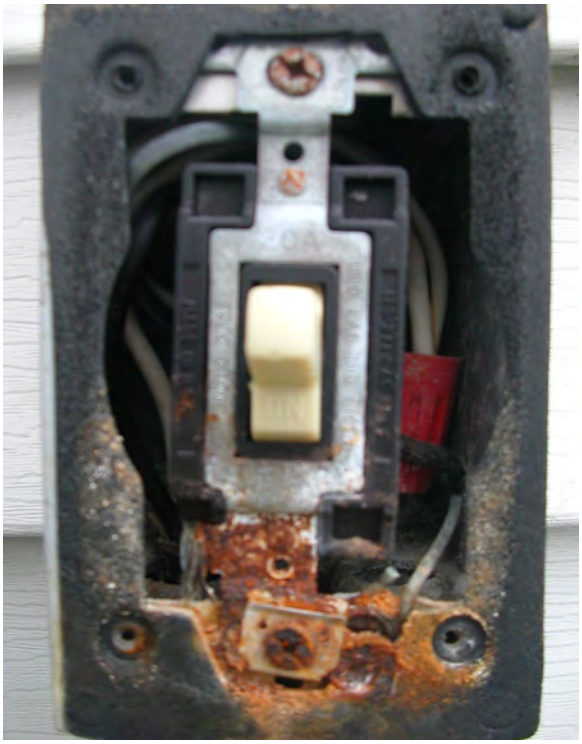
Photograph 15) House #62 – 560 Housatonic Avenue: Electric Box

Photograph 16) House #67 – 56 Minor Avenue: Electric Box

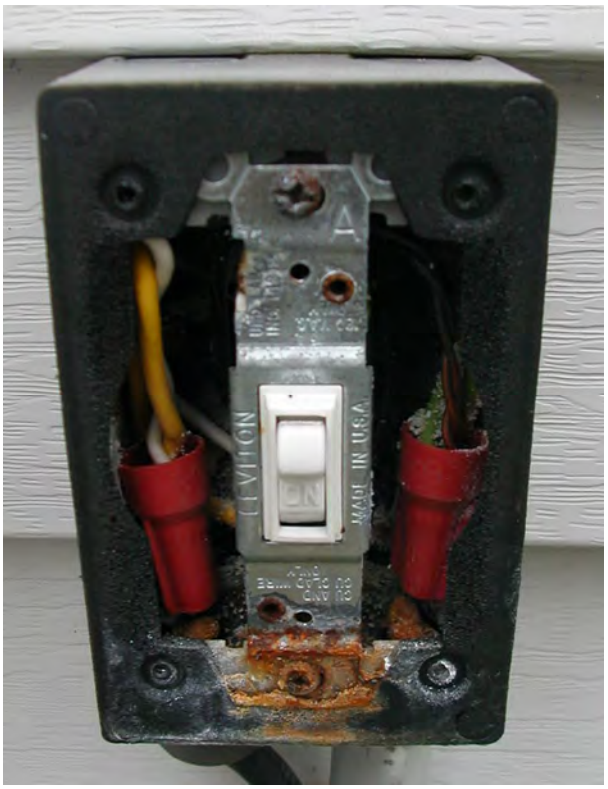
Photograph 17) House #69 – 76 Minor Avenue: Cover

Photograph 18) House #70 – 83 Minor Avenue: Electric Box

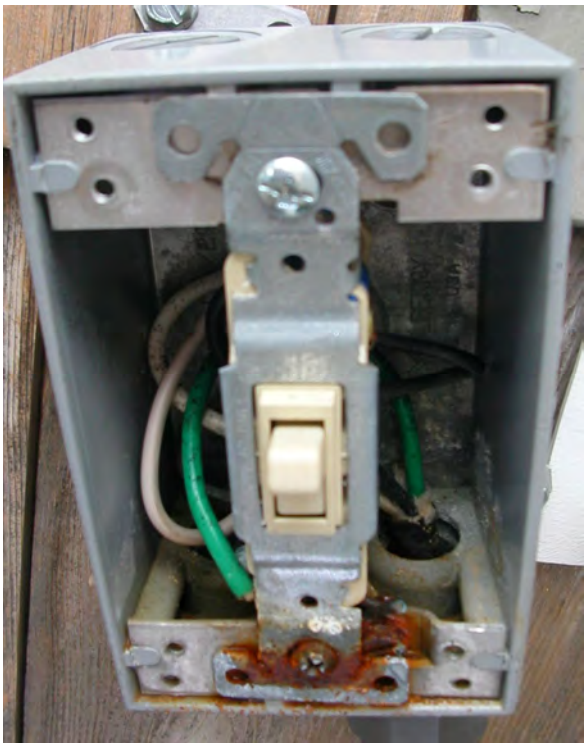
Photograph 19) House #86 – 135 Riverview: Electric Box



Photograph 20) House #89 – 24 Willow Avenue: Electric Box

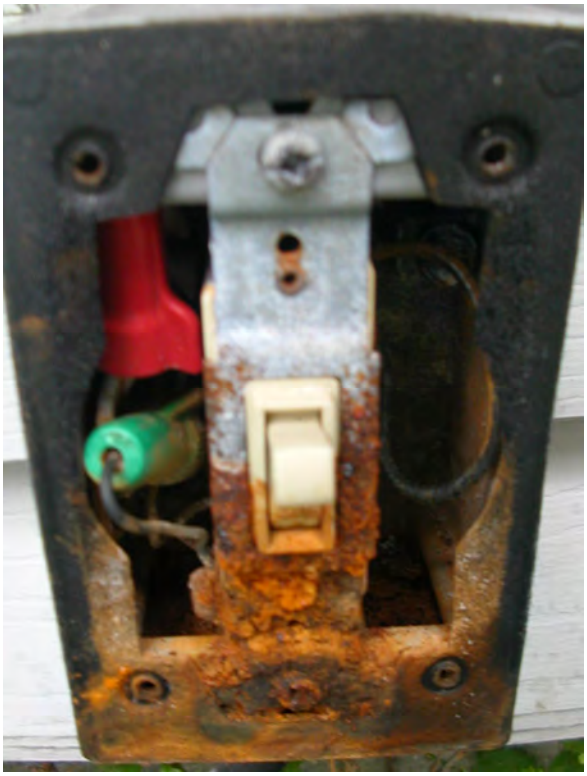


Photograph 21) House #93 – 73 Willow Avenue: Electric Box



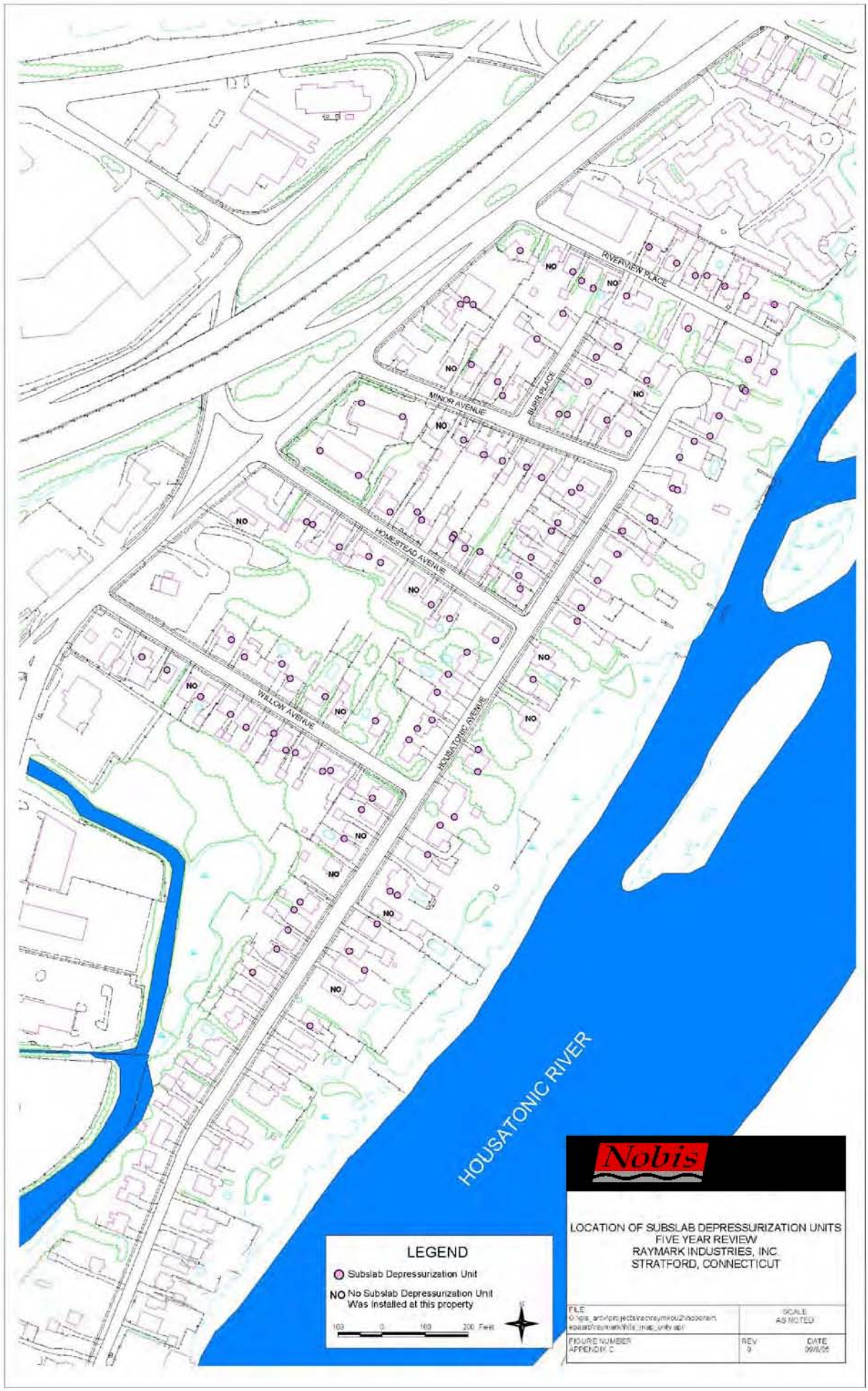
Photograph 22) House #94 – 86 Willow Avenue: Electric Box

Photograph 23) House #95 – 93 Willow Avenue: Electric Box



Photograph 24) House #100 – 116 Willow Avenue: Electric Box

Photograph 25) House #101 – 120 Willow Avenue: Large Bush Preventing Access to Electric Box


RIVERVIEW PLACE
MINOR AVENUE
BURR PLACE
HOMESTEAD AVENUE
WILLOW AVENUE
HOUSATONIC AVENUE
HOUSATONIC RIVER
NO
LEGEND
Subslab Depressurization Unit
NO No Subslab Depressurization Unit Was Installed at this property
100 0 100 200 Feet
Nobis
LOCATION OF SUBSLAB DEPRESSURIZATION UNITS
FIVE YEAR REVIEW
RAYMARK INDUSTRIES, INC
STRATFORD, CONNECTICUT
FILE
SCALE
AS NOTED
FIGURE NUMBER
APPENDIX C
REV
0
DATE
09/05

OPERABLE UNIT (OU) 3

Originally, OU3 was defined as the commercial properties (Morgan Francis, Spada, Housatonic Boat Club), and Ferry Creek and included the surrounding wetlands where Raymark-type waste was known to have been deposited. During the investigation stage, this area was further divided into additional OUs (OU3, Area I; OU3, Area II (OU7); OU3, Area III (OU8); and OU6). Currently, OU3 Area I encompasses the wetland areas of upper Ferry Creek that abut some of the OU6 commercial properties. The RI for OU3, Area I, released by EPA in October 1999, described contamination and potential health risks in this area (TtNUS 1999). Further action at this OU has been delayed at the request of the Raymark Advisory Committee (RAC), a Town appointed citizens group. The RAC requested this delay until a more comprehensive clean-up could be developed for all OUs, in particular OU6. See Appendix C OU7 and Appendix C OU8 for discussions on OU3, Areas II and III, respectively.

Ferry Creek looking upstream from the flood gate (Broad Street).

Ferry Creek looking upstream from the floodgate.

Ferry Creek flood gate.

OPERABLE UNIT (OU) 4

OU4 is located north of the former Raymark Facility. It encompasses a total area of 13.5 acres and includes the 3-acre Raybestos Memorial Ballfield, an 8.5-acre vacant field, and a 2-acre densely wooded area. This OU only addresses the contaminated soils on the property. Groundwater beneath the area is included in OU2. An RI for OU4 was released in August 1999 (TtNUS 1999).

The ballfield was built using waste fill from the Raymark Facility and was used as a softball field from the 1940s until the 1980s. Prior to development as a ballfield, the OU4 Site was used as a gravel pit operation for an unknown period of time and was then used to dispose of brake linings and associated industrial waste. The former Raymark Industries Inc. Company disposed of wastes containing asbestos and non-asbestos material, metals, pheno-formaldehyde resins, and various adhesives on this study area. The southern and western portions of OU4 were used by the Town of Stratford as a dumping and temporary storage area for asphalt, road salt, brush and leaves, dirt, and trash. The public also used this area as a dump. In the 1970s, Raymark Industries, Inc. performed two clean-up activities to place a 2-foot soil cover over identified areas of surficial asbestos contamination.

In 1992, EPA fenced the area, sampled and removed drummed wastes, and placed a soil cover over contamination at the OU4 Site. EPA released a final Remedial Investigation report in August 1999 that described the nature and extent of contamination at this area. Further action at this OU has been delayed by at the request of the Raymark Advisory Committee (RAC), a town appointed citizens group. The RAC requested this delay until a more comprehensive clean-up could be developed for all OUs, in particular OU6. In conjunction with this five-year review, CTDEP inspected the OU4 Site conditions and the effectiveness of the EPA Removal Action.

Based on the site visit, the following was identified and needs future attention:

1. The fence erected by EPA during removal actions has been deliberately cut to provide access between the ballfield and the abutting Contract Plating property. This fence should be repaired to prevent trespassing on the ballfield.

2. Walking trails are visible on the property, indicating trespassing on the property.

3. There is fire damage surrounding the remains of a trailer still evident on the property. A person and at least one animal were living on the ballfield property in a trailer, but due to a propane fire in the trailer, the occupant is no longer on the property. This indicates that there are trespassers on the property.

4. The property access should be limited with better security to prevent trespassers. Signage originally placed surrounding the property is no longer visible or present. Signage is needed on the property group.

5. A break in the fence from a Clinton Avenue residence should be repaired and disposal of yard waste and other trash should be stopped. Residents should be informed that Raymark waste is present on the surface and may pose a risk.

6. Property owner(s) should be informed that on-site dumping of construction or other materials should cease.

7. Attention is needed to address animals burrowing though the cover material into waste.

8. More security on-site is needed to stop vandalism.

Break in Fence between Contract Plating and OU4.

Warning Sign on fence between Contract Plating and OU4 (faces toward Ballfield to warn about Contract Plating).

Neighboring the corner of Patterson and Frog Pond. Bleachers visible in background. Please not the lack of signage on fence.

Overgrown bleacher area.

Trash in storage pad.

Storage pad off Frog Pond Lane.

OPERABLE UNIT (OU) 5

OU5 is approximately 4 acres and includes a 1,340-foot section of Shore Road, the Housatonic Boat Club (HBC), and a small portion of the eastern slope of the Shakespeare Theater property. The area in this OU was originally part of OU3, Area II, area C, which included the HBC area and wetlands south of the HBC, and was evaluated in the Draft OU3 RI report, June 1998. Contaminated soil within the HBC area was further investigated and the area was subsequently identified as OU5.

In 1993, contamination in the OU5 area was covered with a plastic fabric barrier and wood chips by the CTDEP as a temporary measure. The area was sampled extensively in 1998/1999 and high levels of contamination were found in the surface soils. As the area was contaminated, and because the plastic barrier was beginning to wear and the wood chips were beginning to erode, EPA accelerated the clean-up. A Draft Final Engineering Evaluation/Cost Analysis (EE/CA), issued in June, 1999, presented the clean-up alternatives (TtNUS 1999). In September 1999, following the public comment period, EPA released an Action Memorandum documenting its clean-up strategy.

The Action Memorandum stated that EPA would test waste stabilization techniques that could minimize the release of waste dust during the excavation of Shore Road wastes. It also stated that wastes from the Shore Road Study Area would be deposited in a temporary storage facility within Stratford. During the public comment period on the EE/CA, EPA discussed the Raybestos Memorial Ballfield and/or the Contract Plating Company property as potential temporary storage facilities for the approximately 35,000 cubic yards of soil.

Based on the negative public support for waste storage at either location, EPA decided to perform a non-time-critical removal action (NTCRA). This action included capping of contaminated hot spots, relocation of utilities, repair of existing stone riprap revetment, restoration of the western shoulder and embankment cover along Shore Road, and placement of sheet piling to prevent erosion of materials. EPA began these excavation and clean-up activities in 1999 and completed them in 2000. An Interim Removal Action Report for the NTCRA was issued in September, 2002 (Stone & Webster 2002). A Draft Final RI report and a Draft FS report for OU5 were issued in March 2002; however, neither document has been finalized. No additional reports are currently scheduled for release.

Shore Rd. and Housatonic Boat Club.

Shore Road and Shakespeare theatre.

Retaining wall.

Shore road looking from Housatonic Boat Club entrance.

OPERABLE UNIT (OU) 6

OU6 includes 157.1 acres comprised of 24 properties with contaminated soils impacted by waste from the former Raymark Facility. These properties are not all contiguous to each other and are scattered, mainly along the eastern edge of Stratford, running north to south (see Figure 3-2). This OU does not include groundwater (OU2) or sediments (OU3).

Fourteen of the 24 properties were previously evaluated in OU3 as part of a larger investigation of soil and sediments. The OU3 evaluations did not evaluate properties individually, rather the 14 properties were included as part of the larger areas. EPA subsequently decided to divide its efforts into soil-only properties and sediment-only areas. The 14 properties within OU3 became part of OU6 in order to be re-evaluated individually as part of the soil-only evaluation. The remaining 10 properties in OU6 are located throughout the Town.
The property groups for OU6 include:

- Lockwood Avenue
- 200 Ferry Boulevard
- Ferry Boulevard
- Lot Behind 326 Ferry Boulevard and Vacant Lot at Housatonic Avenue
- 326 Ferry Boulevard
- 576 and 600 East Broadway
- Vacant DOT Lot Abutting 1-95
- Connecticut Right-of-Way
- 250, 304, and 340 East Main Street
- 380 East Main Street
- DPW Lot – Area of Concern (AOC) 1
- DPW Lot – Area of Concern (AOC) 2 and 251 East Main Street Properties
- Beacon Point Area of Concern (AOC) 1
- Beacon Point Area of Concern (AOC) 2
- Beacon Point Area of Concern (AOC) 3
- Airport Property North of Marine Basin
- Wooster Park
- Third Avenue

An RI report for the OU6 properties was issued in June 2005 (TtNUS 2005) and a Feasibility Study (FS) in 2010 (EPA 2010). The particular clean-up approaches for these properties vary by property depending on the extent of contamination and the risks to human health and the environment at each property. EPA has issued a proposed plan for final actions on four of these OU6 properties and interim actions on other OU6 properties and other OUs, where exposure to Raymark waste could occur. The interim actions will be designed to mitigate exposure, such as through signs and fences, until final actions can occur.

In 2009, 340 East Main Street required emergency response due to the unauthorized excavation of Raymark waste. The property owner excavated Raymark waste that was buried on the property and spread the Raymark waste on the surface of the property. CTDEP responded to the site on May 18, 2009 to evaluate the conditions at the property and on May 19, covered the excavated material with a membrane and clean fill. On May 20, 2009, EPA Emergency Response arrived on-site to secure additional areas where Raymark waste was placed and to decontaminate mechanical equipment used during the unauthorized excavation. The State of Connecticut filed suit for cost recovery of CTDEP's expenditure and a final injunction prohibits any future activity that could release Raymark waste.

340 East Main Street:

View from East Main Street.

Inside fence near front of property.

Raymark waste disturbed by on-site activities.

Vacant DOT Lot Abutting 1-95:

View from 1-95 property toward shock's auto body.

576/600 East Broadway:

View from 1-95 along 576/600 East Broadway fence toward Ferry Boulevard.

Beacon Point AOC 3:

North end of the outdoor boat storage area.

South end of the outdoor boat storage area.

Vegetated area north of the boat storage area.

Airport Property:

Entrance off Main Street

View from the entrance of Raymark waste disposal area.

Area of Raymark waste near drainage stream.

View of the drainage stream

Wooster Park:

View of Wooster Park/Quail Avenue looking East.

Image of bike path on property.

Waste dumping evidence.

DPW Lot – Area of Concern (AOC) 2 and 251 East Main Street:

View of the back of Frog Pond Tavern.

View of dog pound building.

Area where Raymark waste was identified near dog pound.

OPERABLE UNIT (OU) 7

The area defined as OU7 was originally part of OU3. It includes Lower Ferry Creek and adjacent wetland properties (Area B), the wetlands surrounding the Housatonic Boat Club property (Area C wetlands), and Selby Pond and the surrounding wetlands (Area F). These locations are down-gradient of the former Raymark Facility and may have been affected by wastewater discharge, storm water drainage, surface water runoff, Raymark waste direct deposition, and groundwater contaminant migration. The name designations used for locations and properties in this report are those that have become convention for the study area, as established by EPA. This OU does not include soils (OU6) or groundwater (OU2). An RI for this OU was released in 2000 (TtNUS 2000). Further action at this OU has been delayed at the request of the Raymark Advisory Committee (RAC), a Town appointed citizens group. The RAC requested this delay until a more comprehensive clean-up could be developed for all OUs, in particular OU6.

Area B covers approximately 18 acres, including wetlands, Ferry Creek, a small portion of the Housatonic River, small areas of grass and vegetation, and a man-made ridge or dike composed of fill debris that runs along the edge of wetlands along Lockwood Avenue and Ferry Creek. Area C includes about 8.1 acres of wetlands south and adjacent to Area B. Area F (Selby Pond Site) covers approximately 6.4 acres, including wetlands, open water, and grass and vegetation surrounding the wetlands. Portions of the Area F wetlands are located on residential properties.

Lower Ferry Creek at low tide from Broad Street.

Lower Ferry Creek from Broad Street looking toward the Shakespeare Theater.

Wetland north of Housatonic Boat Club (HBC).

OU5 and Shore Road looking from Housatonic Boat Club entrance.

Mac’s Harbor tidal drainage channels.

Birds feeding in the tidal drainage channels at Mac’s Harbor.

OPERABLE UNIT (OU) 8

The area defined as OU8 was originally part of OU3. OU8 includes a public boat launch area, a dry dock area, and the surrounding wetlands impacted by Raymark waste (north and south of the boat launch) near Beacon Point Road (Area D); and a wetland area along Elm Street adjacent to and south of 1260 Elm Street (Area E). These locations are down-gradient of the former Raymark Facility and may have been affected by wastewater discharge, storm water drainage, surface water runoff, manufacturing waste direct deposition, and groundwater contaminant migration. An RI for this OU was released in 2000 (TtNUS 2000). Further action at this OU has been delayed by at the request of the Raymark Advisory Committee (RAC), a Town appointed citizens group. The RAC requested this delay until a more comprehensive clean-up could be developed for all OUs, in particular OU6.

Area D covers approximately 20 acres, including undeveloped wetlands, open water, and man-made features (the public boat launch, the dry dock area, and an erosion barrier along the shoreline). Area E is a 30-foot-wide strip located approximately 600 feet west of the southern portion of Area D. It covers about 1 acre, which is entirely wetland. This OU does not include soils (OU6) or groundwater (OU2).

OPERABLE UNIT (OU) 9

OU9 includes Short Beach Park and the Stratford Landfill. Short Beach Park is a public recreation area which was constructed over a town landfill in the 1980s. Stratford Landfill is a former landfill used by both the Town of Stratford and the City of Bridgeport; today the landfill accepts material for disposal, recycling and composting.

The OU9 study area encompasses a total of 80.4 acres abutting Long Island Sound near the mouth of the Housatonic River. The historic review performed for these areas indicated that past dumping of Raymark waste had occurred at these locations. Field investigations were undertaken to identify whether soils in the study area contained Raymark waste. This OU does not include sediments or groundwater.

An RI report was issued in July, 2005 (TtNUS 2005). The report found that the study area does contain waste from the former Raymark Facility. Further action at this OU has been delayed by at the request of the Raymark Advisory Committee (RAC), a town appointed citizens group. The RAC requested this delay until a more comprehensive clean-up could be developed for all OUs, in particular OU6.

The HHRA identified actionable risks from receptor exposures to surface contamination at OU9. Surface contamination at OU9 remains exposed to potential receptors. The Town's park and playing fields receive heavy use by town residents and visitors.

Short Beach Park looking across soccer field to Dorne Drive/landfill.

Short Beach Park looking across the golf chipping area toward baseball fields (area of Raymark Waste).

Landfill along Dorne Drive.

Landfill.

APPENDIX D

RAYMARK INDUSTRIES, INC. FACILITY (OU1) ARARS LIST—TABLES 4-2A AND 4-2B, *FINAL SOURCE CONTROL FEASIBILITY STUDY REPORT*, APRIL 1995

TABLE 4-2A
CHEMICAL-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	CONSIDERATION
Criteria, Advisories, and Guidance	TSCA PCB Spill Clean-up Policy (40 CFR 761.120-135)	To Be Considered	This policy applies to recent PCB spills and establishes clean-up levels for PCB spills of 50 ppm or greater at 10 ppm for non-restricted access areas and 25 ppm for restricted access areas.	Standards were considered as guidelines for soil cleanup at the Raymark Facility to address PCB contamination.
	EPA Risk Reference Doses (RfDs)	To Be Considered	RfDs are dose levels developed by EPA for use in estimating the non-carcinogenic effects of exposure to toxic substances.	EPA RfDs were used to assess health risks due to exposure to noncarcinogenic contaminants present at the site. RfDs were used in development of PRGs for facility soils. SC-2 would be consistent with PRGs developed.
	Proposal for the Connecticut Cleanup Standard Regulations (22a-133K CGS)	To Be Considered	The proposed regulations would define minimum hazardous waste site remediation standards, specify numeric criteria for cleanup of soils and groundwater, and specify a process for establishing alternative, site-specific cleanup standards.	The proposed regulations were considered in determining soil cleanup standards. SC-2 would be consistent with the proposed regulations since the selected PRGs are more protective than the proposed direct exposure criteria.
	EPA Carcinogen Assessment Group Potency Factors	To Be Considered	EPA Carcinogenic Potency Factors (CPFs) are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.	CPFs were used to assess health risks due to exposure to carcinogens present at the site. These factors were used in development of PRGs for site soils. SC-2 would be consistent with the PRGs.
	Guidance on Remedial Actions at Superfund Sites with PCB Contamination (EPA/540/G-90/007, August 1990)	To Be Considered	Describes various scenarios and considerations pertinent to determining the appropriate level of PCBs that can be left in each contaminated media to achieve protection of human health and the environment.	This guidance was considered in determining the appropriate level of PCBs that may be left in the soil. SC-2 would be consistent with the guidance.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
Federal Regulatory Requirements	RCRA - General Facility Standards (40 CFR 265.10 - 265.18	Applicable	General facility requirements outline general waste analysis, security measures, inspections, and training requirements.	Remedial actions conducted under this alternative would be constructed and operated in accordance with the substantive provisions of this requirement. Alternative SC-2 would comply.
	RCRA - Preparedness and Prevention (40 CFR 265.30 - 265.37)	Applicable	Outlines requirements for safety equipment and spill control.	Safety and communication equipment would be maintained at the site and local authorities would be familiarized with the site operations, in accordance with the substantive provisions of these requirements. Alternative SC-2 would comply.
	RCRA - Contingency Plan and Emergency Procedures (40 CFR 265.50 - 265.56)	Applicable	Outlines requirements for emergency procedures to be used following explosions, fires, etc.	Contingency plans would be developed and response activities would be implemented in accordance with the substantive provisions of these requirements. Alternative SC-2 would comply.
	RCRA - Groundwater Monitoring (40 CFR 265.90 - 265.93)	Applicable	Details requirements for groundwater monitoring and responding to releases from Solid Waste Management Units.	A groundwater monitoring program would be developed in accordance with the substantive provisions of these requirements. Alternative SC-2 would comply.
	RCRA - Closure and Post-Closure (40 CFR 265.110 - 265.120)	Applicable	Details requirements for closure and post-closure of hazardous waste facilities.	Remedial actions implemented under this alternative would be designed to meet the substantive provisions of this requirement. Alternative SC-2 would comply.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
Federal Regulatory Requirements (Continued)	RCRA - Tank Systems Closure & Post-closure Care (40 CFR 265.197)	Applicable	Contains closure and post-closure requirements for tank systems or individual tanks used for storage of hazardous wastes.	Decontamination and removal of hazardous waste storage tanks would be conducted in accordance with the substantive provisions of these requirements. Alternative SC-2 would comply.
	RCRA - Surface Impoundments (40 CFR 265.228)	Applicable	Details the closure requirements for a RCRA surface impoundment.	The design, construction, maintenance, and monitoring of the cap would meet the substantive provisions of this requirement. SC-2 would comply.
	RCRA - Landfills (40 CFR 265.310)	Applicable except for (40 CFR 265.310(b)(2))	Includes requirements for the closure and post-closure of landfills.	SC-2 would comply since a final cover would be designed and constructed to meet the ARAR.
	TSCA - PCB Storage and Disposal (40 CFR 761.60, .75, .79)	Applicable to PCBs at 50 ppm or greater, removed after February 17, 1978.	This regulation establishes standards for the storage, disposal, and incineration of PCBs at a concentration greater than 50 ppm.	SC-2 would comply with the exception of certain landfill requirements which will be waived under TSCA.
	CAA NESHAPS (40 CFR 61 Subpart M (61.145, 61.150, 61.151) Subpart M, 61.154	Applicable Relevant and Appropriate	These regulations specify requirements regarding removal, management, and disposal of asbestos.	Handling and disposal of soils containing asbestos and building demolition debris containing asbestos would comply with the substantive provisions of these regulations. Alternative SC-2 would comply.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
State Regulatory Requirements	Connecticut Air Pollution Regulations - Stationary Sources (Sec. 22a-174-3 RCSA)	Applicable	Requires that stationary sources of air pollutants meet specified standards prior to construction and operation. Prohibits operation of sources that interfere with attainment of Air Quality Standards.	The gas collection and treatment system would be designed to meet substantive standards established under these regulations. Alternative SC-2 would comply.
	Connecticut Air Pollution Regulations (Sec. 22a-174-4, 22a-174-5, and 22a-174-7 RCSA)	Applicable	These sections specify air emissions monitoring requirements, emissions sampling and analysis methods, and general air pollution control equipment operation requirements.	Operation and monitoring of the emission control systems would be conducted in accordance with the substantive requirements of these regulations. Alternative SC-2 would comply.
	Connecticut Air Pollution Regulations - Fugitive Dust Emissions (RCSA 22a-174-18b)	Applicable	Requires that reasonable precautions be taken to prevent particulate matter from becoming airborne during demolition and construction activities and material handling operations.	Activities involving building demolition, soil excavation or handling, and cap construction would be conducted in a manner to minimize fugitive dust emissions from the facility. Alternative SC-2 would comply.
	Connecticut Air Pollution Regulations - Hazardous Air Pollutants (RCSA 22a-174-29)	Applicable	Establishes testing requirements and allowable concentrations for any stack emission for the constituents listed.	Emissions control systems for vapor control would be designed and operated to meet the substantive requirements of these regulations. Alternative SC-2 would comply.
	Connecticut Hazardous Waste Site Management Regulations (Sec. 22a-449(c)-105, RCSA)	Applicable	These regulations outline requirements for the management and disposal of hazardous wastes, and the construction, location, operation, and closure of hazardous waste treatment, storage, and disposal facilities. These regulations incorporate by reference substantial portions of 40 CFR 265 (RCRA).	This alternative would comply with those portions of the regulations that are more stringent than the corresponding federal RCRA regulations cited herein.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
State Regulatory Requirements (Continued)	Connecticut Water Quality Standards (issued pursuant to Sec. 22a-426 CGS)	Applicable	Establishes designated uses for groundwater and surface water and identifies the criteria necessary to support these uses.	SC-2 would comply with water quality standards since actions are taken to minimize further degradation of groundwater and surface water.
	Connecticut - Discharge of Stormwater Associated with Industrial Activity (Sec. 22a-430b, 22a-430, CGS; Sec. 22a-430-1 to -8, RCSA)	Applicable	Establishes permit, monitoring and reporting requirements for the management and discharge of storm waters.	SC-2 would comply with the substantive requirements of this regulation.
	Connecticut - Air Pollution Control - Control of Odors (Sec. 22a-174-23 RCSA)	Applicable	This regulation prohibits emission of substances that constitute nuisances because of objectionable odors. Several compounds have specific concentration limits.	SC-2 would comply with this regulation during implementation.
Criteria, Advisories, Guidance	TSCA PCB Spill Clean-up Policy (40 CFR 761.120-135)	To Be Considered	This policy applies to recent PCB spills and establishes cleanup levels for PCB spills of 50 ppm or greater at 10 ppm for non-restricted access areas and 25 ppm for restricted access areas.	This policy would be considered in the management of PCB contamination.
	Guidance on Remedial Actions of Superfund Sites with PCB Contamination (EPA/540/G-90/ 007, Aug. 1990)	To Be Considered	Describes various scenarios and considerations pertinent to determining the appropriate level of PCBs that can be left in each contaminated media to achieve protection of human health and environment.	This guidance was considered in management of PCB contamination under Alternative SC-2, and it would be consistent with this guidance.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
Criteria, Advisories, Guidance (Continued)	CAA NAAQS for Particulate Matter (40 CFR 50.6)	To Be Considered	The particulate matter NAAQS specifies maximum primary and secondary 24 hour concentrations for particulate matter in the ambient air. These ambient air concentrations are not designed to apply to specific sources; rather, states may promulgate State Implementation Plan emission limits applicable to sources, which would result in attainment and maintenance of the NAAQS. Connecticut has not promulgated any particulate matter emission limits applicable to this source.	Fugitive dust emissions from soil-waste handling activities would be minimized with temporary enclosures and dust suppressants, if necessary. These measures should be sufficient to prevent any exceedences in the ambient air of the 150 $\mu g/m^3$ 24-hour primary standard for particulate matter. Alternative SC-2 would be consistent.
	RCRA, Air Emissions from TSDFs, (40 CFR, Part 265, Subpart CC) (Proposed 56 Fed Reg. 33490-33598, 7/22/91)	To Be Considered	Proposed standards for air emissions from treatment, storage, disposal facilities with VOC concentration equal to or greater than 500 ppm.	Proposed standards would be considered in design of the vapor control system if threshold VOC concentrations are met. Alternative SC-2 would be consistent.
	U.S. EPA Technical Guidance - Final Covers of Hazardous Waste Landfills and Surface Impoundments (EPA/530-SW-89-047)	To Be Considered	Provides technical specifications for the design of multi-layer covers at landfills where hazardous wastes were disposed.	This guidance would be considered in the design of the cap and associated systems.

TABLE 4-2B
ACTION-SPECIFIC ARARs AND TBCs FOR ALTERNATIVE SC-2
DECONTAMINATION, DEMOLITION, CONSOLIDATION, NAPL REMOVAL, CAPPING, AND INSTITUTIONAL CONTROLS
FINAL FEASIBILITY STUDY REPORT
RAYMARK INDUSTRIES, INC. FACILITY, STRATFORD, CONNECTICUT

AUTHORITY	REQUIREMENT	STATUS	REQUIREMENT SYNOPSIS	ACTIONS TO BE TAKEN TO ATTAIN REQUIREMENT
Criteria, Advisories, Guidance (Continued)	Proposal for the Connecticut Cleanup Standard Regulations (22a-133K CGS)	To Be Considered	The proposed regulations would define minimum hazardous waste site remediation standards, specify numeric criteria for cleanup of soils and groundwater, and specify a process for establishing alternative, site specific cleanup standards.	Portions of this guidance would be considered in implementing SC-2.

Notes:

CGS - Connecticut General Statutes
RCSA - Regulations of Connecticut State Agencies

APPENDIX E

CTDEP O&M ADDENDUM
ROUTINE FORMS FOR SITE INSPECTION

CTDEP O&M ADDENDUM

12.0 OPERATIONS & MAINTENANCE PLAN AMENDMENT #1, NOVEMBER 2005

The following sections of the Final Operations and Maintenance Manual, prepared by Foster Wheeler Corporation in July 1998, have been amended to reflect changes to the site.

1.4 Site Description

The site was redeveloped in 2001, and currently contains three retail stores and parking areas. In 2005, a bank was added on the Western side of the site. EPA and DEP reviewed and provided approvals for all work associated with this redevelopment. All construction drawings related to the redevelopment were submitted by the developer, approved by CTDEP and EPA, and are part of the agencies records.

4.1.2 Water Quality Unit Maintenance

The quarterly inspection of the 16 water quality units (WQU) is the responsibility of the current retailers association. Any necessary cleaning of the WQU is also their responsibility. This responsibility was transferred from the CTDEP to the property owners after the site was redeveloped in 2001.

4.3 Sump Pumps

Counters were added to the sump pump controls to keep track of their running time. Each pump has a counter which begins when the pump turns on and stops counting when the pump shuts off, allowing the O&M operator to verify that the pumps have been working properly. The counter numbers are recorded on the western field log each week, and checked against the previous week's numbers to determine that the pumps have been running.

5.7 Soil Gas Collection System Vapor Phase Carbon Units

The vapor phase carbon units are no longer used in the western soil gas treatment system. Based on the results of the air sampling of emissions from the west building, conducted from September 1998 through February 2004, the carbon vessels were no longer needed to remove volatile organic compounds (VOCs) from effluent air for the treatment system. The stack emissions VOC concentrations were calculated for each air sampling period, and were below the maximum allowable stack concentrations each time. In April 2004, the vapor phase carbon units were removed and the exhaust is currently vented directly to the exterior atmosphere.

6.6 Enhanced Soil Gas Collection System Thermal Oxidizer

The thermal oxidizer was disconnected in May 2005, and the soil gas and enhanced soil gas collection systems are currently treated with vapor phase carbon units. Since 1998, the thermal oxidizer was used in conjunction with a soil vapor extraction system to treat soil vapor at the site. Based on soil vapor analytical data, increasing energy and maintenance costs for the thermal oxidizer, and discussions with CTDEP, the thermal oxidizer was replaced with activated carbon

treatment units. The carbon sizing estimate used for the system design was based on the quarterly air sampling data collected from September 1998 to November 2004, and the soil vapor extraction flow rates collected weekly while the system was in operation. The carbon treatment system consists of six, 175 pound, virgin activated carbon vessels. The carbon units were installed in 3 parallel sets of 2 units each (primary and secondary units) in series. The influent and effluent air streams on the carbon units, as well as the air streams between the carbon units, are monitored with a photoionization detector and a manometer as part of the weekly maintenance tasks. These results are recorded on the Eastern Treatment Field Logs and the Weekly O&M Inspection/Maintenance Task forms. Details of the carbon units and system design are provided in new Appendix P, Eastern System Carbon Adsorption Treatment System. The revised Eastern Treatment System Field Logs are included in Appendix J, Inspections and Maintenance Reporting Forms. The O&M procedures for the new vapor phase carbon units are provided in Section 6.7, outlined below.

6.7 Equipment Group #13, Vapor Phase Carbon Units

6.7.1 Major Components

Six (6) 175 lb. vapor carbon vessels, in 2 parallel series.

6.7.2 System Functional Description

Six 175 lb. vapor phase carbon vessels are utilized to remove volatile organic compounds (VOCs) from the soil gas. The life of the carbon vessels is dependent on the concentration of contaminants within the extracted soil gases and the relative humidity of the soil gas. Weekly monitoring of the soil gases entering, exiting and between the carbon vessels is required for the operator to determine when the vessels need to be changed out.

6.7.3 Inspection Tasks

Inspection of the carbon vessel system should be performed weekly and documented on the eastern field logs. The inspection should include:

- Check the vessels for leaks, rust, water or other damage
- Check for leaks in the system piping
- Monitor and document VOCs, vacuum and pressure readings using field instruments on-site.

Off-site laboratory analysis of air samples shall be conducted quarterly.

6.7.4 Maintenance Procedures

The vapor phase carbon vessels are relatively maintenance free. However, when breakthrough is detected in the first vessel series, the following replacement procedure should be followed.

- Once breakthrough has been detected, the operator should contact the carbon supplier (TIGG) to arrange for delivery of new vessels and disposal of old vessels.
- The latest laboratory analytical results should be supplied to the carbon disposal vendor for them to characterize the vessels, prior to disposal.

- The operator should verify that the delivery truck has a lift gate to load and unload the carbon vessels. A hand truck is located in the eastern building for moving the vessels in and out of the building.
- Open the dilution air on the air blowers in service (B-3, B-4, and/or B-5).
- Close the valve ahead of the moisture separator.
- Purge the carbon vessels with clean air for 10 minutes.
- Shut down the air blowers.
- Disconnect the pipes from each carbon vessel.
- After capping the inlet and outlet ports, remove the primary vessels from the building.
- Relocate the secondary vessels into the primary positions.
- Place the new vessels into the secondary positions.
- Reconnect the pipes to the carbon vessels.
- Restart the air blowers.
- Check the pipe connections for leaks, and correct if necessary.
- Open the moisture separator valves.
- Close the dilution air on the blowers.

6.7.5 Sampling Procedures

The following outlines the sampling procedures and equipment required to ensure that the carbon vessels effectively remove the VOCs present in the soil gas. The on-site analysis sampling shall be performed weekly, and the off-site analysis sampling shall be conducted quarterly. The air blowers should be operating during these procedures.

On-site Analysis Sampling

- Monitor the air streams for VOCs. Connect a photoionization detector to the inlet air stream sample port, and document the reading on the eastern field log.
- Repeat for each of the other sample ports (midfluent air streams 1, 2 and 3, and outlet air stream)
- Monitor the air streams for vacuum. Connect a manometer to the inlet air stream sample port, and document the reading on the eastern field log.
- Repeat for each of the other sample ports (midfluent air streams 1, 2 and 3, and outlet air stream)
- Document all of the pressure readings on the system.

Off-site Analysis Sampling

- Obtain two 1-liter SUMMA canisters from the off-site laboratory.
- Remove the cap from one SUMMA canister.
- Screw the hose fitting from the inlet air sampling port into the SUMMA canister.
- Open the sampling port, and open the valve on the SUMMA canister.
- Allow the canister to fill in accordance with the laboratory supplied protocol.
- When the canister is full, close the canister valve and the sampling port.
- Remove the hose fitting from the canister and replace the cap.
- Label the canister with the sample number, date, time, sampler and analysis required.

- Fill out the chain of custody with the sample information.
- Repeat the procedures at the outlet air sampling port.

7.5 DNAPL Storage Tank

The tank level sensor was replaced in September 2000, with a new sensor. The original Gems sensor was not working correctly, thus it was replaced with a new Drexel Brook ultrasonic sensor. The new sensor manual is provided in Appendix E.

The DNAPL storage tank was replaced in June 2005. The original stainless steel tank developed a leak in July 2003, and the tank was pumped out and cleaned at that time. The tank was removed and replaced with a fiberglass reinforced plastic tank. The new tank is the same size (1,000 gallons), with the same connections as the old tank. Details and drawings of the new tank are provided in Appendix E.

Table 9-1 Groundwater Monitoring Wells

The tops of a few of the groundwater monitoring wells were raised during the site redevelopment in 2001. An updated table with the new well elevations is provided as Table 9-1A.

9.6 Monitoring Well Sampling Schedule and Well Sampling Procedures

In July 1999 the number of groundwater monitoring wells included in the quarterly monitoring was changed from 14 to 12, six of which are the same as listed in the O&M manual and six that are different than listed in the manual. These 12 monitoring wells are 1S, 2S, 4S, 6M, 7S, 9S, 9D, 10S, 12S, 13S, 13D and 15S. The quarterly groundwater sampling schedule was changed from quarterly to semiannually in April 2003.

10.1 Western Treatment Building

An emergency shower and eye wash station, and a sink were added to the western treatment building in August 2005. These were added into the equipment room of the building. CTDEP notified EPA of this work on June 16, 2005 and provided a copy of the proposed construction drawings for EPA records. When this work is complete, final record drawings will be prepared. Manufacturers' literature for the water/sewer service components and the shower and eyewash are provided in Appendix M.

10.7 PLC System Alarm Display Panel

The alarm display units in each building were replaced with new units in June 2005. The original Allan Bradley Messageview units stopped working and it was more cost effective to replace them with new units than to repair them. They were replaced with Vorne Industries Message Display units. The new user's manuals and programming information are provided in Appendix I.

12.0 OPERATIONS & MAINTENANCE PLAN AMENDMENT #2, MAY 2006

The following sections of the Final Operations and Maintenance Manual, prepared by Foster Wheeler Corporation in July 1998, have been amended to reflect changes to the site.

7.0 DNAPL RECOVERY SYSTEM

7.2 DNAPL Recovery System Operation

In February 2006, a new pump system was installed into the DNAPL recovery well 3. The new system consists of a QED Teflon pulse pump, model LP1301, and a QED pump controller, model C100. Details on the pump and controller are included in Appendix E.

7.4 Equipment Group #15: DNAPL Extraction Pumps

7.4.1 Major Components

Number of Pumps:	One
Pump Type:	Submersible pulse pump
Flow Rate:	1 gpm
Materials of Construction:	Teflon
Other materials included:	QED C100 programmable controller, 4" Teflon coated in-well exhaust valve, ¾" OD Teflon tubing to connect the pump inlet air valve to the compressor, 1/2" OD Teflon tubing to connect the pump discharge line to the existing DNAPL conveyance piping.

7.4.2 System Function Description

The system is comprised of one (1) QED model 1301 Teflon pulse pump, one (1) QED model C100 pump controller, one (1) QED model 400 compressor, and the associated tubing and cables. Details on the pump and controller are included in Appendix E.

The pump is hooked up to the controller that is hooked up to the compressor. The controller runs on solar power, and also has an AC adapter so it may run on electricity. An explosion-proof, GFI outlet is installed in the recovery well vault, so that the new controller may be operated with electricity. The compressor runs on a marine battery.

7.4.3 Inspection Tasks

On a weekly basis, the operator shall perform a brief system review to insure that the piping and equipment within the well vault are in working order. The inspection shall include the following:

- Check the recovery well for water and leaks
- Check that the heat trace is operational

7.4.4 Maintenance Procedures

The following maintenance activities shall be performed on a monthly basis for the DNAPL extraction pump:

- Check the DNAPL level in the recovery well with an oil/water interface probe.
- Manually run the pump system if any DNAPL is detected with the probe.
- Document these procedures on the Western Treatment System Field Logs

12.0 OPERATIONS & MAINTENANCE PLAN AMENDMENT #3, MAY 2007

The following sections of the Final Operations and Maintenance Manual, prepared by Foster Wheeler Corporation in July 1998, have been amended to reflect changes to the site.

5.0 SOIL GAS COLLECTION SYSTEM

5.2 SGC PROCESS OPERATION

In January 2007, a new screen system was installed in the moisture separators on blowers B-1, B-2, B-3 and B-5. The new system consists of a B&K 1" PVC Union, model/stock number 164-135HC, Whedon Products lavatory strainer, model number DP40C, LDR 1" closed black nipple, model/stock number 300 1XCL and a Danco lavatory pop-up drain gasket, model/stock number 80346. All products are to be found at the Home Depot on site. Details on the screens are included in Appendix B. All modifications described herein apply to the following sections.

5.4 Equipment Group #2: Air Blower B-1
5.5 Equipment Group #3: Air Blower B-2
5.8 Equipment Group #6: Air Blower B-3
5.9 Equipment Group #7: Air Blower B-5

5.4.1 Major Components
5.5.1 Major Components
5.8.1 Major Components
5.9.1 Major Components

- ***B&K*** 1" PVC Union, model/stock number 164-135HC
- ***Whedon Products*** lavatory strainer, model number DP40C
- ***LDR*** 1" closed black nipple, model/stock number 300 1XCL
- ***Danco*** lavatory pop-up drain gasket, model/stock number 80346

5.4.2 System Function Description
5.5.2 System Function Description
5.8.2 System Function Description
5.9.2 System Function Description

The system is comprised of two screens. Details on the screens are included in Appendix B.

The screens are connected to the float switch PVC inlets located inside the moisture separator tank. The screens' function is to prevent any material that is sucked into the moisture separator from impeding the proper operation of the level float switch.

5.4.4 Operations and Maintenance Procedures
5.5.4 Operations and Maintenance Procedures
5.8.4 Operations and Maintenance Procedures
5.9.4 Operations and Maintenance Procedures

The following operations and maintenance activities shall be preformed on a monthly basis. The operator shall perform a brief system inspection to insure that the equipment (e.g. liquid pump) within the moisture separators are in working order. The inspection shall include the following:

- Check to insure the screens are clean from debris.

12.0 OPERATIONS & MAINTENANCE PLAN AMENDMENT #4, MAY 2009

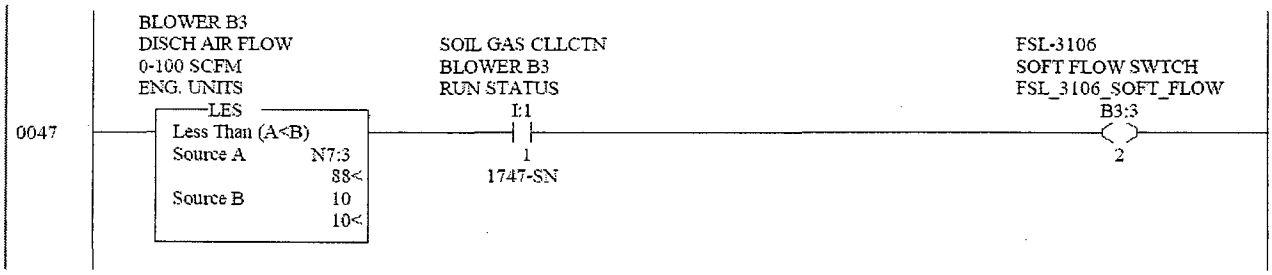
The following sections of the Final Operations and Maintenance Manual, prepared by Foster Wheeler Corporation in July 1998, have been amended to reflect changes to the site.

APPENDIX I: Section 14 (E Bldg – PLC Ladder Logic drawings)

The Eastern Treatment Building was transmitting alarms (low-flow) for blowers that were not in operation (Blowers 3, 4, and 5). The Western Treatment Building was similarly transmitting a false alarm for Blower 1. It was determined that elements were missing from rungs in the ladder logic which made blower operation a necessary prerequisite for an alarm signal. Therefore, a "SOIL GAS CLLCTN RUN STATUS" bit was added to rungs 47, 75, and 101 of the Eastern Treatment Building (Blowers 3, 4, and 5, respectively) and to rung 40 of the Western Treatment Building (Blower 1).

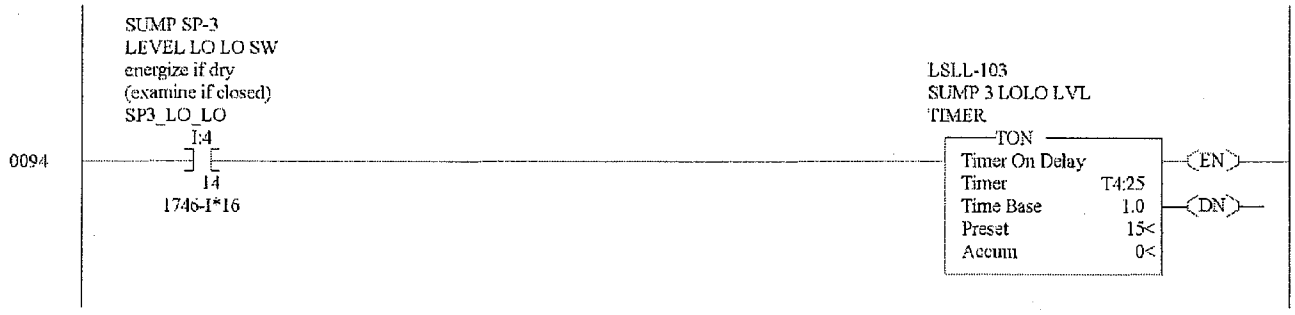
To illustrate, shown below is rung 47 after the change was implemented:

Update to ladder logic rung for false alarms (typical):

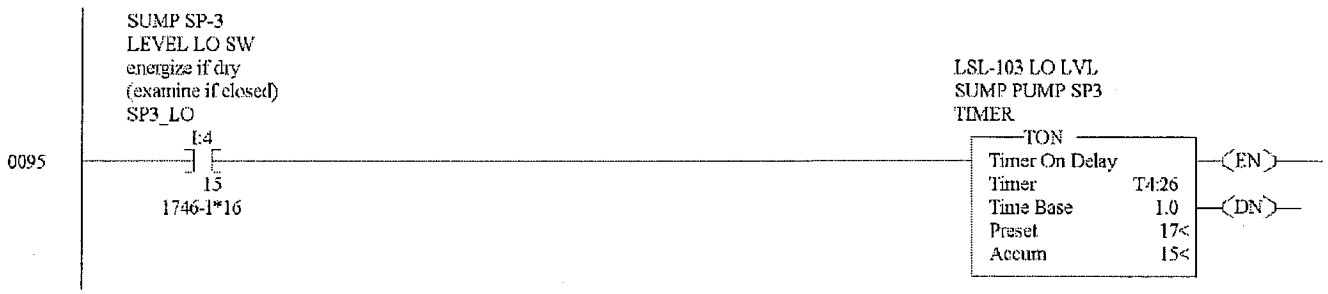


In addition, the ladder logic was also modified based on field observations that as water fell below the low level sensors in the manhole for sump pump SP3 of the Western Treatment Building, the pump ran dry for several seconds before shutting off. This shut off signal is transmitted from the PLC and is based on a timer in the ladder logic. In order to prolong the operational life of the pumps, the low-low sensor accumulation time was reduced from 20 to 15 seconds (rung 94) and the low sensor accumulation time was reduced from 20 to 17 seconds (rung 95).

Update to ladder logic rung for Western Treatment Building SP3 LOLO sensor:



Update to ladder logic rung for Western Treatment Building SP3 LO sensor:



ROUTINE FORMS FOR SITE INSPECTION

WEEKLY O&M INSPECTION/MAINTENANCE TASKS
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 1 of** 5

Operator: _____

I. Soil Gas Collection System

Collection/Conveyance Piping

1. Collect/Document Air Stream Parameters for Each SGC Header?	Yes ___ No ___	See Section 5.4 for Sampling Procedures. Record data on Field Logs.
2. Water Present in Drip Legs?	Yes ___ No ___	If yes, indicate which drip leg(s) and remove as outlined in Section 5.3.3.
3. MOVs Operational	Yes ___ No ___	

Air Blowers (B-1, B-2, B-3 & B-5)

1. Unusual Noises/Vibrations	Yes ___ No ___	If yes, indicate which blower on Field Logs.
2. Leaks Present?	Yes ___ No ___	If yes, indicate which blower and where on Field Logs.
3. Document P&I Readings?	Yes ___ No ___	Use Field Logs.

Condensate Pumps

1. Unusual Noises/Vibrations	Yes ___ No ___	If yes, indicate which condensate pump on Field Logs.
2. Leaks Present?	Yes ___ No ___	If yes, indicate which condensate pump and where on Field Logs.

Instrumentation

1. Document P&I Readings?	Yes ___ No ___	Use Field Logs.
2. Check Chart Paper?	Yes ___ No ___	

Vacuum Monitoring Wells

1. Check and Document Vacuum readings?	Yes ___ No ___	

WEEKLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 2 of** 5

Operator: _____

II. Condensate Storage Tanks

1.	Inspect Integrity of tank system.	Yes ___ No ___	Document any leaks and/or damage.
2.	Document Water level?	Yes ___ No ___	
3.	Carbon Vent Filter Adsorption Indicator Brown?	Yes ___ No ___	If yes, carbon vent filter needs to be replaced.

III. Vapor Phase Carbon Vessels

1.	Inspect for Leaks	Yes ___ No ___	Document any leaks and/or damage.
2.	Monitor inlet/outlet Streams?	Yes ___ No ___	Use Field Logs.

IV. Enhanced Soil Gas Collection System

Conveyance Piping

1.	Collect/Document Air Stream Parameters for Each ESGC Header?	Yes ___ No ___	See Section 6.3.4 for Sampling Procedures. Document data on Field Logs.

Air Blowers (B-4 & B-6)

1.	Unusual Noises/Vibrations	Yes ___ No ___	If yes, indicate which blower on Field Logs.
2.	Leaks Present?	Yes ___ No ___	If yes, indicate which blower and where on Field Logs.
3.	Document P&I Readings?	Yes ___ No ___	Use Field Logs.

WEEKLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 3 of** 5

Operator: _____

Condensate Pumps

1. Unusual Noises/Vibrations	Yes ___ No ___	If yes, indicate which condensate pump on Field Logs.
2. Leaks Present?	Yes ___ No ___	If yes, indicate which condensate pump and where on Field Logs.

Instrumentation

1. Document P&I Readings?	Yes ___ No ___	Use Field Logs.
2. Check Chart Paper?	Yes ___ No ___	

V. Thermal Oxidizer

1. Calibrate LEL/O_2 Sensor?	Yes ___ No ___	See Appendix D for procedure.
2. Calibrate Flow Transmitter?	Yes ___ No ___	See Appendix D for procedure.
3. Check Chart Paper?	Yes ___ No ___	

VI. DNAPL Recovery System

Recovery Wells

1. Leaks Present?	Yes ___ No ___	If yes, indicate location and severity.
2. Water Present in Well	Yes ___ No ___	If yes, indicate location and severity.
3. Document Totalizing Flow?	Yes ___ No ___	

WEEKLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 4 of** 5

Operator: _____

Conveyance Piping

1. Heat Tracing Operational?	Yes ___ No ___	
2. Heat Tracing Damaged?	Yes ___ No ___	If yes, indicate location and severity.
3. Liquid Present in Leak Detection Ports?	Yes ___ No ___	If yes, indicate location.
4. Check Pressure Gauge?	Yes ___ No ___	Document on Field Log.

DNAPL Extraction Pumps

1. Pumps Operational?	Yes ___ No ___	If no, indicate which pump is not.
2. Check Control System?	Yes ___ No ___	

DNAPL Storage Tank

1. Leaks Present?	Yes ___ No ___	If yes, indicate location and severity.
2. Document volume of DNAPL in tank.	Yes ___ No ___	Use Field Log.

Fire Suppression System

1. Backup Batteries Charged?	Yes ___ No ___	See Appendix G.
2. Document Discharge Canister Pressure.	Yes ___ No ___	

VII. Building Systems

Heating

1. Dust Present on Heating Elements?	Yes ___ No ___	If Yes, clean as required.

Ventilation

1. Fans Operational?	Yes ___ No ___	

WEEKLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 5 of** 5

Operator: _____

Building Systems

1. Leaks in roof/walls? Yes ___ No ___ If yes, indicate location and severity.
2. Standing water present? Yes ___ No ___ If yes, indicate location and severity.
3. Check Security System? Yes ___ No ___
4. Check Autodialer? Yes ___ No ___

Pavement

1. Pavement clear of debris? Yes ___ No ___ If No, indicate location and severity.

QUARTERLY O&M INSPECTION/MAINTENANCE TASKS
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 1 of** ____
Operator: _____

I. Soil Gas Collection System

Collection/Cenveyance Piping

1. Water Present in Drip Legs? Yes ___ No ___ If yes, indicate location and remove.

Pressure/Vacuum Relief Valves

1. Inspect Mechanical Seals Yes ___ No ___ Document Condition.

II. Thermal Oxidizer

1. Inspect Control Panel Connections Yes ___ No ___

2. System Interlocks Functional? Yes ___ No ___
   Dust Magnetic Contacts? Yes ___ No ___

ANNUAL O&M INSPECTION/MAINTENANCE TASKS
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 1 of** ____
Operator: _____

I. RCRA Cap

Cap Inspection

1. Damage to Survey Monuments?	Yes ___ No ___	If yes, indicate type/severity

II. DNAPL Recovery System

Fire Suppression System

1. Conduct Annual Inspection?	Yes ___ No ___	

III. Building Systems

Fire Extinguishers

1. Conduct Annual Inspection?	Yes ___ No ___	

IV. Stormwater Treatment Units

1. Cleanout sediment and oil?	Yes ___ No ___	Adjust maintenance schedule based on condition of Stormceptors.

MONTHLY O&M INSPECTION/MAINTENANCE TASKS
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 1 of** 3
Operator: _____

I. RCRA CAP

Cap Inspection

1. Soil Erosion?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
2. Differential Settling?	Yes ___ No ___	If yes, indicate location and whether settling is greater than or less than 6 inches on Site Plan.
3. Evidence of Burrowing Animals?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
4. Damage to Survey Monuments?	Yes ___ No ___	If yes, indicate type/severity.
5. Unauthorized Woody Vegetative Growth?	Yes ___ No ___	If yes, indicate type, location Vegetative and severity on Site Plan.

Pavement Inspection

1. Cracks >1 inch?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
2. Potholes?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
3. Differential Settling?	Yes ___ No ___	If yes, indicate location and whether settling is greater than or less than 6 inches on Site Plan.
4. Vegetative Growth?	Yes ___ No ___	If yes, indicate type, location and severity on Site Plan.

Perimeter Fence

1. Damage Presence?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
2. Evidence of Intrusion?	Yes ___ No ___	If yes, indicate location on Site Plan.

MONTHLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 2 of** 3
Operator: _____

Vegetative Cover

1. Bare Spots > 6"?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.
2. Traffic Damage?	Yes ___ No ___	If yes, indicate location and severity on Site Plan.

Stormwater Collection System

1. Inspect Stormceptors?	Yes ___ No ___	Use Stormceptor Inspection Monitoring Form.

Monitoring Wells

1. Inspect integrity of wells?	Yes ___ No ___	

II. Soil Gas Collection System

Air Blowers (B-1, B-2, B-3 & B-5)

1. Belts Cracked/Worn?	Yes ___ No ___	If yes, indicate which blower on Field Log. Form.
2. Sludge Present in Mositure Separators?	Yes ___ No ___	If yes, indicate which blower on Field Log.
3. In-Line Filter Clean?	Yes ___ No ___	If no, replace.
4. Leaks?	Yes ___ No ___	If yes, indicate which blower, location and severity on Field Log.

Condensate Pumps

1. Inspect Mechanical Seals	Yes ___ No ___	Document Condition.

MONTHLY O&M INSPECTION/MAINTENANCE TASKS (Continued)
Raymark Superfund Site
Stratford, CT

Date: _____ **Page 3 of** 3
Operator: _____

III. Thermal Oxidizer

1. Check Fuel Train Valves?	Yes ___ No ___	See Appendix D.
2. Inspect UV Sensor?	Yes ___ No ___	See Appendix D.
3. Inspect Ignition Plug?	Yes ___ No ___	See Appendix D.

IV. DNAPL Recovery System

Fire Suppression System

1. Inspect Canisters?	Yes ___ No ___	Document damage.
2. Inspect piping/nozzles?	Yes ___ No ___	Document damage.
3. Check Inspection/ Certification Date?	Yes ___ No ___	Document.

V. Building Systems

Heating

1. Thermostats Operational? Yes ___ No ___

Ventilation

1. Calibrate Combustion Gas Sensor? Yes ___ No ___

Security

1. Dust Magnetic Contacts? Yes ___ No ___

Fire Extinguishers

1. Inpect for Damage?	Yes ___ No ___	If damaged, indicate severity.
2. Check Inspection/ Certification date?	Yes ___ No ___	Document.

Emergency Shower and Eye Wash Station

1. Flush for 5 minutes? Yes___ No___